

Agriculture

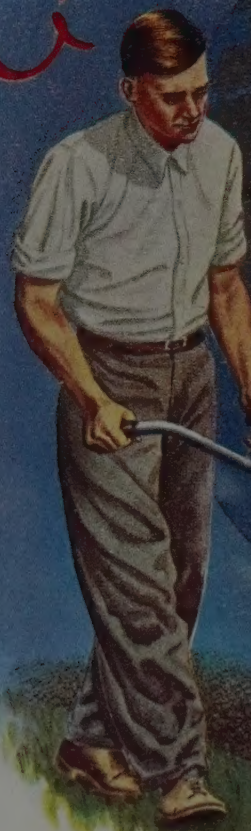
MAY - 1955



Encircles the World

Landmaster

ROTARY HOES



4 MODELS

2 H.P. "GAMECOCK"—4 stroke engine, 3 speeds, rubber tyres, 10in. cut.

3 H.P. "RESTER"—4 stroke engine, 3 speeds, rubber tyres, 16in. cut.

4 H.P. "RESTER DE LUXE"—4 stroke engine, 3 forward speeds and REVERSE, rubber tyres, 14in. cut.

5 1/2 H.P. "HAWK"—4 stroke engine, 3 forward speeds, and REVERSE, POWER STEERING, rubber tyres, 10in. cut.

Wide range of attachments, including mowers, cultivators and ridgers for all models.

Landmaster - today's Widest Range - Best Value in Rotary Hoes



SMALL POWER EQUIPMENT CO.

P.O. Box 2765 Wellington

AGENTS:

D. Archibald & Sons, Kaitia. D. Faithfull, Kerikeri. Central. Paine Brothers, Kaitake. Mawson Engineering, Dargaville. Alfred Buckland & Sons, Wellsford. Central Garage, Maungaturoto. Rodney Motors, Warkworth. A. H. Wright, Kumeu. Moore's, Henderson. Gandy's Motors, Howick. Paine Brothers, Otahuhu. Douglas Wood Ltd., Pukekohe. Brough Marlow, Hamilton. Walsh Motors, Cambridge. Hare Brothers, Paeroa. Wm. Judd Ltd., Thames. Putaruru Auctioneering Co. G. E. Clark & Sons, Tauranga. John Winlove & Sons, Waipukurau. Bayliss & Booth, Te Puke. Bell & Hodgson, Waimana. N. Andrews, Taihape. Sayers Brothers, Stratford. Mason & Paton, Waipukurau. Hessey & Sons, Waipawa. Percy & Henderson, Hastings. Ulake and Strawbridge, Feilding. N.Z. Loan Co., Dannevirke. Ward Motors, Marton. Hackett Motors, Wanganui. Field Machinery Co. Ltd., Palmerston North. Ivory Bros. Ltd., Wellington. Marlborough Farm Machinery, Blenheim. Graighead & Bartlett, Nelson. D. A. Rice & Co., Christchurch. Ashburton Implement Service. Richardson Trading, Timaru. Bruce Christie & Co., Dunedin. Wilson Elliott Ltd., Balclutha. Burrows Brothers, Gore.

Volume 90

Number 5

16 May

1955

(Established 1910)

NEW ZEALAND JOURNAL OF *Agriculture*

Published by

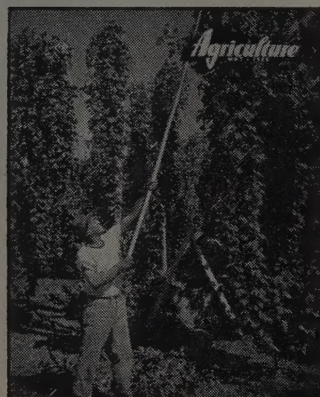
Direction

of

Rt. Hon. K. J. Holyoake,

Minister of Agriculture

This Month's Cover



Hop production in New Zealand is confined almost entirely to Waimea County, Nelson Province, where the soil and climate are very suitable for the crop. Production can fluctuate considerably and in recent years annual yields have ranged from 800,000lb. to 1,250,000lb. Almost all of the hops are used locally, mainly by breweries, but small quantities have been exported in some seasons. Though several hop-picking machines have been introduced this year, harvesting in most of the gardens is still done by hand and to meet the demand for pickers labour is brought to Nelson from other centres. This month's cover, which is reproduced from a colour photograph by Tom Lloyd, shows hop picking in a Nelson garden.

New Zealand Department of Agriculture

HEAD OFFICE:

Dominion Farmers' Institute Building,
Featherston Street, Wellington

DIRECTOR-GENERAL:

E. J. Fawcett

ASSISTANT DIRECTOR-GENERAL:

R. B. Tennent

DIVISIONAL DIRECTORS:

Animal Industry ..	J. E. Mellwaine
Animal Research ..	J. F. Filmer
Dairy	H. A. Foy
Extension	P. W. Smallfield
Horticulture	A. M. W. Greig

Editor: G. J. Neale

TABLE OF CONTENTS

Tolerance of Clovers to Weedkillers	Shona M. Maclean, L. J. Matthews, and J. N. Fitzgerald ..	450
Chinese Wisteria is a Beautiful Climber	F. E. Wilkin ..	458
An Efficient Fattening House for Pigs	A. Longwill ..	459
The Home Orchard in Winter	N. B. Congdon ..	465
Sixth Laying Trial of Prospective Poultry Breeding Stock	F. C. Bobby ..	471
Winter Show Dates		475
<i>Clematis indivisa</i>	F. E. Wilkin ..	476
Propagation of Seedless Barberry	R. E. Yates ..	477
Meteorological Records for March		480
The Home Garden	A. G. Kennelly ..	481
Onion Growing Trials on Rukuhia Peat	I. L. Elliott ..	489
Drain Cleaning Attachment for a Tractor	D. F. Scott ..	491
Care of Livestock during June		492
Dairy Produce Graded for Export		492
Winter Pasture Management and Supplementary Feeding (Seasonal Notes)		493
Improving Winter Egg Production of Household Poultry	H. H. Watson ..	495
Topdressing in Waimarino County	A. K. Booth ..	497
Trees on the Farm: Planting Technique	W. H. Jolliffe ..	503
A Simple and Easily Constructed Wax Mould	L. A. M. Griffin ..	505
Soil Testing Service to Farmers	J. E. Bell ..	507
Poisoning Wild Pigs with Arsenic Trioxide	J. A. Miller ..	511
Recent Research Work: Phosphate Topdressing		513
Hormone Control of Nodding Thistle	W. A. McKellar ..	515
Radio Broadcasts		516
The Flower Garden	K. H. Marcussen and M. Joanna Lockie ..	517
A Winter Sports Outfit with Contrasting Motifs		527
Yeast Cookery	Daphne Eilers ..	529
Making Table Mats, Cloths, and Napkins	Betty Johnston ..	535
Fruit Desserts for Winter	Maud B. Strain ..	542

SUBSCRIPTION RATES

The "Journal" is issued monthly. The subscription within New Zealand is 10s. a year; the overseas subscription is 13s. (sterling). The "Journal" may be ordered from any bookseller or newsagent, or direct from any office of the Department of Agriculture. Individual copies are available from Publications Section, P.O. Box 2298, Wellington, at 1s. a copy, post free.

Subscription inquiries (preferably accompanied by the address cut from a recent "Journal" wrapper) should be sent to the nearest office of the Department of Agriculture.

COPYRIGHT PROVISIONS

Articles in "The Journal of Agriculture" are copyright, but may be reprinted, provided both the "Journal" and author are acknowledged.

The Minister of Agriculture does not accept responsibility for any of the private and trade advertisements included in this publication.

All correspondence relating to the "Journal" should be addressed to the Editor, "The New Zealand Journal of Agriculture", P.O. Box 2298, Wellington.

REGISTERED AT THE G.P.O., WELLINGTON, AS A MAGAZINE





Tolerance of Clovers to Weedkillers

CLOVERS are an essential constituent of grazing pastures in New Zealand, but are major weeds in playing greens for sports such as bowls. Where clovers are desirable plants the major problem is to control the weed species with as little damage as possible to the clovers present. Where clovers are undesirable species the problem is to control the clovers without damage to the associated species of value—usually fine-leaved grasses. In both cases the tolerance of clovers to the various weedkillers employed must be known and also the tolerance of the weeds and the desirable species associated with the clover in the sward. This article by Shona M. Maclean, Research Officer, and L. J. Matthews, Weeds Research Officer, both of the Department of Agriculture, Wellington, and J. N. Fitzgerald, formerly Research Officer, Department of Agriculture's Invermay Agricultural Research Station, gives the latest results from trials to determine tolerance of clovers to various weedkillers.

CLOVER damage may be particularly serious in young pastures and in clover seed crops. On the other hand temporary clover suppression in a pasture may do little or no harm in some circumstances. Clovers may be considered weeds in annual crops, ryegrass seed crops, and playing greens. Red clover is a serious weed in some lucerne seed crops. For these reasons experimental work was carried out to determine the tolerance of different clover species to various weedkillers.

Seven trials have investigated the tolerance of clovers to the more commonly used weedkillers. Four of these trials were carried out at the Invermay Agricultural Research Station and three were conducted at the Marton Experimental Area.

Details of Trials

At Invermay three of the trials were laid down in 1951. Each trial investigated the effect of weedkillers on a different clover species. As a result of these investigations a large-scale trial which included white clover, subterranean clover, Montgomery red clover, and broad red clover (cowgrass) was laid down in December

1952 to make a more detailed study of clover tolerance. At Marton the first experiment on clover tolerance was carried out on a very weedy spring-sown pasture in 1952. The clovers were sown at a standard rate for a pasture mixture, but the clovers did not establish with sufficient density to give good comparative figures of the effects of weedkillers. A more detailed trial therefore followed in 1953 on an area sown with heavy rates of clover seed. For this later trial and the trials at Invermay pure sowings of clovers were made, but broad red clover was not sown at Marton. In addition to regular observations, quadrat counts on the two Marton trials and point analyses on the major trial at Invermay were taken to obtain a measure of the effect of the weedkillers on the density of the clovers.

In the third trial at Marton an attempt was made to compare the effect of the ethyl ester of 2,4-D applied to uncut and freshly mown white clover growth respectively to see if hard grazing before spraying could reduce clover damage.

All weedkillers were applied at standard rates of application and under conditions simulating practical spray

applications. Details of weedkillers used and the stages of growth at which they were applied are summarised in Table 1.

Results of Trials

A summary of the effects of each weedkiller on the clovers is presented in this article. A paper by J. N. Fitzgerald giving interim results of the Invermay trials has been published in the proceedings of the Sixth New Zealand Weed Control Conference. A later paper, by P. B. Lynch, Crop Experimentalist, Department of Agriculture, Wellington, published in the proceedings of the Seventh New Zealand Weed Control Conference, discusses the importance of clover damage in pastures. The information used in this article is based mainly on the detailed results of the major trial at Invermay, which is now completed, and the major trial at Marton, particularly the latter.

Tolerance of Clovers

In the Marton trial both before spraying and also 2 months after spraying, 4 sample areas each of $\frac{1}{4}$ sq. ft. chosen at random were counted. The "before" counts were used as a check on the uniformity of the plots before they were sprayed. At Invermay point analyses were carried out 10 weeks after spraying to determine the reduction in clover density.

Counts of clover plants were made at Marton at the two times of spraying—at the 2 to 3 true leaf stage and when the plants were well established.

HEADING PHOTOGRAPH: The trial area at the Department of Agriculture's Invermay Agricultural Research Station.

The figures obtained from the counts on the more recent and the more detailed Marton trial were examined statistically and are quoted in Tables 2 and 3.

Almost all the weedkilling preparations cause a marked reduction in the density of young clovers (2 to 3 true leaves). Exceptions are the ammonium D.N.B.P. preparation, which has little effect on white clover, and the sodium salt of M.C.P., which has only a slight effect on Montgomery red clover. By the time the clovers are well established nearly all the weedkillers are less severe in their effect on the clovers.

Significant differences in clover counts also occurred between weedkillers. The differences in effect on clovers sprayed at the 2 to 3 true leaf stage (Table 2) were:—

Subterranean clover: Amine D.N.O.C. and butyl ester of 2,4,5-T caused significantly more damage than ammonium D.N.B.P., sodium M.C.P., and ethyl ester of 2,4-D.

Red clover: Significantly more clover damage was caused by amine D.N.O.C., butyl ester of 2,4,5-T, and ethyl ester of 2,4-D than by ammonium D.N.B.P. or sodium M.C.P.

White clover: All other preparations caused significantly more clover damage than did ammonium D.N.B.P. Amine D.N.O.C. was the most severe treatment and the ethyl ester of 2,4-D was the least severe. The difference in the amount of clover present on the plots sprayed with these two treatments (amine D.N.O.C. and ethyl ester of 2,4-D) was also significant.

Below—Effect of butyl ester of M.C.P. at 1lb. acid equivalent per acre on semi-mature white clover at Invermay.
Left—Clover treated with M.C.P.
Right—Control plot.

WEEDKILLERS USED IN TRIALS ON CLOVERS—451

TABLE 1—DETAILS OF WEEDKILLERS USED

Type	Formulations used	Rates used per acre	Stages of growth at which application was made
Phenols D.N.B.P. (dinitro-ortho-secondary butyl phenate) D.N.O.C. (dinitro-ortho-cresol)	Ammonium salt	* $\frac{1}{2}$ lb. *1lb. *2lb.	Cotyledon stage, true leaf unfolding. Sub-mature Cotyledon stage, true leaf unfolding. Sub-mature 2-3 true leaf stage. Sub-mature
	Diethylamine salt	6lb. (4.38lb. phenol equivalent)	2-3 true leaf stage. Sub-mature
Hormones M.C.P. (2 methyl, 4 chlorophenoxyacetic acid)	Sodium salt	$\frac{1}{2}$ lb. acid equivalent (not based only on 2,4 isomer content) 1lb. acid equivalent (not based only on 2,4 isomer content)	Cotyledon stage, true leaf unfolding. Sub-mature Cotyledon stage, true leaf unfolding. 2-3 true leaf stage. Sub-mature. Mature
	Butyl ester	1lb. acid equivalent (not based only on 2,4 isomer content)	2-3 true leaf stage. Sub-mature. Mature
	Amine salt	1lb. acid equivalent (not based only on 2,4 isomer content) 1.6lb. acid equivalent (not based only on 2,4 isomer content)	2-3 true leaf stage. Sub-mature. Mature
		2,4-D (2,4-dichlorophenoxyacetic acid)	Sub-mature Cotyledon stage, true leaf unfolding. Sub-mature
	Ethyl ester	$\frac{1}{2}$ lb. acid equivalent 1lb. acid equivalent	Cotyledon stage, true leaf unfolding. 2-3 true leaf stage. Sub-mature. Mature
	Triethylamine salt	1lb. acid equivalent	2-3 true leaf stage. Sub-mature. Mature
	Di- and tri-ethanolamine salt	1lb. acid equivalent	Mature
2,4,5-T (2,4,5-trichlorophenoxyacetic acid)	Polyethylene glycol ester (P.E.G.)	1lb. acid equivalent	Mature
	Butyl ester (isomeric form)	$\frac{1}{2}$ lb. acid equivalent 1lb. and 3lb. acid equivalent	Cotyledon stage, true leaf unfolding. Sub-mature 2-3 true leaf stage. Sub-mature. Mature
Others I.P.C. (isopropyl-N-phenyl carbamate)	Oil emulsion	1lb., 2lb., and 4lb.	Pre-emergence. Sub-mature. Mature
T.C.A. 90 (trichloroacetic acid)	Sodium salt	5lb., 10lb., and 20lb. (T.C.A. equivalent = 79.3 per cent. of these rates)	Pre-emergence. Sub-mature. Mature

* Present methods of analyses indicate that the phenol equivalent stated here will have to be reduced slightly.



ORDER NOW FOR
PROMPT DELIVERY!

Boothmac

QUALITY BUILT

PLOUGHS

Single Furrow Swamp Plough (illustrated at right) and 2 or 3 Furrow general purpose Plough. Also available . . . Boothmac mole drain Plough.

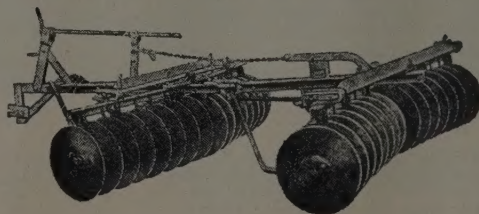
For use with any Tractor equipped with 3 point hydraulic system . . .



HARROWS

"Steel King" Disc Harrows—single or Tandem models available. Other models . . . Massive Disc Harrow . . . 4, 5 and 6 aside, plain or scalloped blades. Tripod and Chain . . . Zig Zag Chain . . . S. and R. Tine . . . Spike Tooth Integral.

Huge range available . . . At right—Boothmac



New Zealand Manufactured by

BOOTH MACDONALD & CO. LTD.

Head Office: Christchurch. Area Offices and Agencies throughout New Zealand

Science in the Service of Agriculture



PLANT PROTECTION LIMITED

What it means to New Zealand Farmers

WHAT IS PLANT PROTECTION LTD? Plant Protection Ltd. is an all British Company established and staffed by agricultural and horticultural scientists with both academic and practical training in all matters affecting the welfare of growing crops throughout the world.

WHAT IT MEANS TO THE NEW ZEALAND FARMER: Plant Protection Ltd. offers through your local 'Plant Protection' distributors a range of Weedicides, Fungicides and Insecticides which have been developed by the best scientific brains in the industry and proved suitable for use in this country for the purpose recommended.

THESE ARE "PLANT PROTECTION" PRODUCTS —

'Ethone' 2.4-D—For Weeds in Pastures.

'Turfex' 40% D.D.T. Dust—For grass grub and grass caterpillar.

'Frenokone' 2.4-D—For Buttercup, Ragwort, etc.

'Agroxone' 4 MCP—Selective weedkiller for pastures and cereals.

'Butoxone' 2.4.5-T—For Blackberry and Gorse.

You can place full trust in any product carrying the 'Plant Protection' symbol

NEW ZEALAND AGENTS FOR PLANT PROTECTION LTD., ENGLAND

IMPERIAL CHEMICAL INDUSTRIES (N.Z.) LIMITED

P.O. BOX 900,
AUCKLAND.

P.O. BOX 1592
WELLINGTON.

P.O. BOX 1486,
CHRISTCHURCH.

The differences in effect on clovers sprayed when semi-mature (Table 3) were:—

Subterranean and white clovers: Only butyl ester of 2,4,5-T caused significantly more damage than all other preparations. For red clover the plots sprayed with ethyl ester of 2,4-D as well as those sprayed with butyl ester of 2,4,5-T had significantly less clover than all other sprayed plots. However, there was significantly more clover on the ethyl ester of 2,4-D plots than on the butyl ester of 2,4,5-T plots.

The results show that the three clover species compared offer different tolerances to weedkillers, that their resistance increases with age, and that changes in tolerances occur among the species between the two stages of growth compared.

Effect of Weedkillers

The effects of the weedkillers used in the trials were:—

Phenols

D.N.B.P.: On young clovers this weedkiller was one of the least harmful preparations. It caused a 15 per cent. reduction in the number of young white clover plants, whereas the least damaging hormone preparations caused a 50 per cent. reduction, but it was more harmful than sodium M.C.P. on young red and subterranean clovers. There was a 25 per cent. reduction in clover density with sodium M.C.P. and a 35 per cent. reduction with D.N.B.P., which was the only weedkiller that did not cause a significant reduction in the density of young white clover. In the trial on spring-sown pasture the amount of white clover in spring was significantly increased (by 40 per cent.) after an application of D.N.B.P. at the early establishment stage of the clovers. Here D.N.B.P. aided clover establishment by reducing competitive weed growth.

When the clovers had become semi-mature D.N.B.P. gave the least damage to clovers, and clovers in all plots sprayed with D.N.B.P. were similar to the untreated clovers on the control plots.

D.N.O.C. was most toxic to all three types of young clovers. With red and white clovers only 15 per cent. of the clovers survived and with subterranean clover 25 per cent. However, when the clovers were well established D.N.O.C. was one of the least harmful preparations and as good as D.N.B.P. in this respect. The difference in the number of plants surviving after spraying at the seedling stage and after spraying when the plants were well established was statistically significant.

Hormones

M.C.P.: The sodium salt of M.C.P. was very toxic to white clover at the seedling stage, but it caused less damage than any other weedkiller on

TABLE 2—EFFECT OF PHENOL AND HORMONE PREPARATIONS ON THREE CLOVERS IN EARLY (2-3 LEAF) STAGE AT MARTON EXPERIMENTAL AREA

Type of clover	Control	Mean	No. of Plants	per 2 sq. ft.		Ethyl 2,4-D 1lb.	Butyl 2,4,5-T 1lb.
		Ammonium D.N.B.P. 2lb.	Amine D.N.O.C. 6lb.	Sodium M.C.P. 1lb.	Ethyl 2,4-D 1lb.		
Subterranean ..	42	*26	*11	*32	*28	*5	
Red (Montgomery) ..	48	*32	*7	*35	*2	*2	
White ..	105	93	*15	*27	*50	*20	

TABLE 3—EFFECT OF PHENOL AND HORMONE PREPARATIONS ON THREE CLOVERS IN SEMI-MATURE STAGE AT MARTON EXPERIMENTAL AREA

Type of clover	Control	Mean	No. of Plants	per 2 sq. ft.		Ethyl 2,4-D 1lb.	Butyl 2,4,5-T 1lb.
		Ammonium D.N.B.P. 2lb.	Amine D.N.O.C. 6lb.	Sodium M.C.P. 1lb.	Ethyl 2,4-D 1lb.		
Subterranean ..	51	44	41	45	43	*21	
Red (Montgomery) ..	42	47	47	47	25	*6	
White ..	71	64	65	63	*52	*12	

* The difference between these figures and the control is statistically significant; that is, there is less than one chance in 20 that this difference is not real. Any difference between the control figure and figures without asterisks means that the differences could be due to chance.

red and subterranean clovers at a similar stage. It reduced the plant density of seedling white clover plants by 75 per cent., but only 25 per cent. of seedling red and subterranean clover plants were killed. The action of the butyl ester of M.C.P. was more severe than that of the sodium salt.



Effect of T.C.A. at 20lb. per acre on semi-mature white clover at Invermay. Foreground—Clover treated with T.C.A. Background—Control plot.

LUSTAR

is the PAINT which kills rust and preserves timber. This outstanding preparation which is **EQUALLY BENEFICIAL** to metals, timber, fabrics, ropes, asbestos-cement, etc., etc., also has a **NATURAL AFFINITY** for living tissue, and is therefore an ideal antiseptic dressing.

Particularly recommended for all Farmers and Orchardists . . . "LUSTAR"
Gals. 25/-; 4-gals. 80/-; drums £30
(in black only)

from
Your Stock Firm or Hardware Merchant.

Distributed by:
McGILL AGENCIES
BOX 1507, WGTN.



One man in one day with one Lightning Mould will make one hundred concrete blocks 18in. x 8in. x 6in. to build those pig houses, sheds, etc.

Enquire from your Dairy Factory, Hardware Merchant or Stock and Station Agent for free illustrated pamphlet, or write direct to:

H. E. NAPIER LTD.
Box 1555, Wellington

Lightning Fence Post Moulds also available.

WARATAH

**STEEL
FENCE POSTS**
WE CAN NOW SUPPLY
FARMERS DIRECT.



NEW APPROVED PRICE
4/6 EACH

F.O.B. OR F.O.R. MAIN
N.Z. PORTS.



For your needs write to:

Russell & Somers Ltd.

G.P.O. Box 194
Wellington

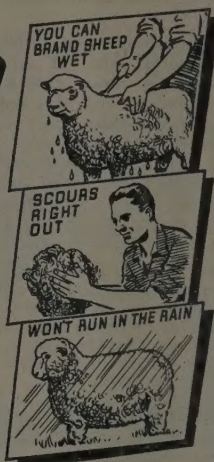
C.P.O. Box 1284
Auckland

You can even Brand them WET!

Yet another Elliott triumph. FIRST with practical liquid phenothiazine — FIRST with easy oesophageal drenching — NOW the firm with a branding fluid that does everything the Farmer wants!

NOTE THESE SPECIAL POINTS:

- WILL NOT RUN IN THE RAIN
- SCOURS RIGHT OUT
- COMPLETELY LEGIBLE
- REMAINS CLEAR AND SHARP
- ENSURES TOP WOOL PRICES



Elliotts BRANDING FLUID

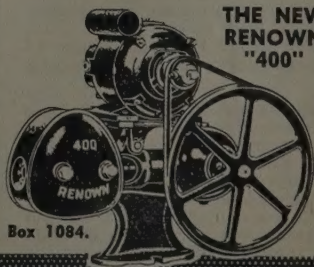
FROM YOUR USUAL STOCK and STATION AGENT
Marketed by Elliotts N.Z. Company, ELLCO LTD., Onehunga, Auckland.

Proved... in more than 30,000 N.Z. Homes and farms

Renown water systems represent the accumulated designing, manufacturing and installation experience of more than 75 years of pump specialisation. No matter where your water is or how you want it delivered — there's a Renown Pump to do the job better and probably at less cost too.

W. H. PRICE & SON Ltd.

34-36 Manchester St., Ch'Ch. P.O. Box 1084.



THE NEW
RENOWN
"400"

RENOWN WATER SYSTEMS

When the clovers were sub-mature all formulations of M.C.P. had very little effect on all types of clovers, causing only a slight distortion of the plants and a temporary check in growth. The butyl ester was slightly more harmful, but the majority of the plants recovered quickly and permanent clover damage was slight (see illustration on page 451). Though all formulations of M.C.P. severely damaged white clover at the seedling stage, it was one of the least harmful preparations by the time the plants were well established.

In the major trial at Invermay the M.C.P. compounds were applied when the clovers were flowering. The number of flowers was reduced considerably, usually by 50 to 70 per cent., but the vigour of the plants seemed to be affected less at the flowering stage than when plants were mature but not flowering. It is probable that a portion of the hormone was taken up by the flower heads, which wilted and dropped off.

At all stages of growth clovers treated with M.C.P. which were affected but not killed recovered rapidly.

2,4-D preparations proved more severe than M.C.P. preparations on red and subterranean clovers at the seedling stage, especially with red clover, on which the ethyl ester of 2,4-D was significantly more severe than the sodium salt of M.C.P. However, the counts indicated (though this was not established statistically) that the 2,4-D preparations were less severe on seedling white clover than were the M.C.P. preparations. The ethyl ester of 2,4-D caused a 50 per cent. reduction in white clover plants and the sodium salt of M.C.P. a 75 per cent. reduction. Trial evidence showed, however, that when the clovers were well established the reverse was true for white clover. This is shown in Table 3; there is significantly less white clover on the ethyl ester of 2,4-D plots than on the control, but the sodium M.C.P. treatment is similar to the control.

On seedling clover plants (2 to 3 true leaves) the ethyl ester of 2,4-D appeared to cause less damage on subterranean than on the other two types. The ethyl ester of 2,4-D had a similar effect to D.N.B.P. on subterranean clover, both preparations reducing the clover density by 35 per cent., but the former was very much more toxic on seedling red clover, causing almost a complete kill. D.N.B.P. caused 35 per cent. reduction of red clover plants and the ethyl ester of 2,4-D a 95 per cent. reduction, the difference in amount of damage being statistically significant.

On well-established clovers 2,4-D caused less depression than on plants at the 2 to 3 true leaf stage. Well-established red clover appeared to be more severely damaged by all formulations of 2,4-D than were the other two clovers. Recovery of white and subterranean clovers, both of plants



Leaves of Montgomery red clover (left) which show the effect of pre-emergence application of T.C.A. at 10 lb. per acre. At right are two normal leaves.

sprayed as seedlings and when well established, was fairly good.

When formulations of 2,4-D were compared amines and salts appeared less severe in their action on seedling clovers than the ethyl ester, but at maturity all formulations caused little damage. The most severe formulation appeared to be the P.E.G. ester of 2,4-D.

When white and red clovers were sprayed while flowering 2,4-D preparations (especially P.E.G. 2,4-D) reduced the number of seed heads by 80 to 90 per cent. Slight distortion of the plants occurred, but was temporary. White clover recovered rapidly, but the retarding effect was noticed for a longer period on Montgomery and broad red clovers. Montgomery red clover usually recovered better than broad red clover.

In one trial at Marton the effect of mowing clover before an application of ethyl ester of 2,4-D was examined. On the day of spraying half the trial was mown to give a comparison of the effect of 2,4-D on long and short growth of white clover, which was flowering at the time of mowing and spraying. The long clover was slightly more damaged than the short clover, but there was no effect on subsequent herbage yields.

2,4,5-T: Butyl ester of 2,4,5-T applied at 1 lb. and 3 lb. acid equivalent per acre caused the most damage of all weedkillers on all clovers whether

young or mature. On all seedling clovers an application of 2,4,5-T resulted in almost a complete kill—from 80 to 95 per cent. of the plants were killed in the Marton trial. When the clover plants were well established 2,4,5-T was still as severe in its action on red and white clovers, causing more than 80 per cent. reduction of plants. However, subterranean clover was significantly less damaged if sprayed when semi-mature than when at the seedling stage. Thirty per cent. more subterranean clover plants survived when spraying was made at the semi-mature stage than when seedling subterranean clover was sprayed.

Clovers were distorted, wilted, and burnt by 2,4,5-T. The 1 lb. and 3 lb. applications were equally severe in their distorting effects, but the survival rates were slightly better for the 1 lb. application. Recovery after 3 months on seedling and semi-mature clovers was up to 30 per cent. on plots which received 1 lb. per acre. This recovery, which was particularly noticeable in the subterranean clover plots where reseedling had taken place, may have been due in part to new plants establishing from seed.

Others

T.C.A.: T.C.A. was applied at three rates, 5 lb., 10 lb., and 20 lb. per acre, on mature and sub-mature clovers and as a pre-emergence treatment. Clovers were found to be most susceptible to T.C.A. applied as a pre-emergence

Farm Piping

THE FLEXIBLE WAY

Take a coil of CONTOUR PIPE over your shoulder, a pocket knife and blow lamp and you are fully equipped to lay 500 feet or so of pipe line. Due to ease of laying installed cost is less than any other pipe—that's real flexibility.

CONTOUR PIPE is quickly and easily installed and can be adapted to pumps, troughs and any existing galvanised water or skim milk reticulation scheme. It's almost indestructible. It withstands frost and will not burst. It withstands corrosion by water or soil, skim milk, caustic and most acids. It comes in 50, 100, 200, 300 and 500 foot coils.

free!

illustrated brochure from your stock and station agent, dairy factory or store or direct from Neill, Cropper & Co. Ltd., Auckland, Wellington, Christchurch and Dunedin.



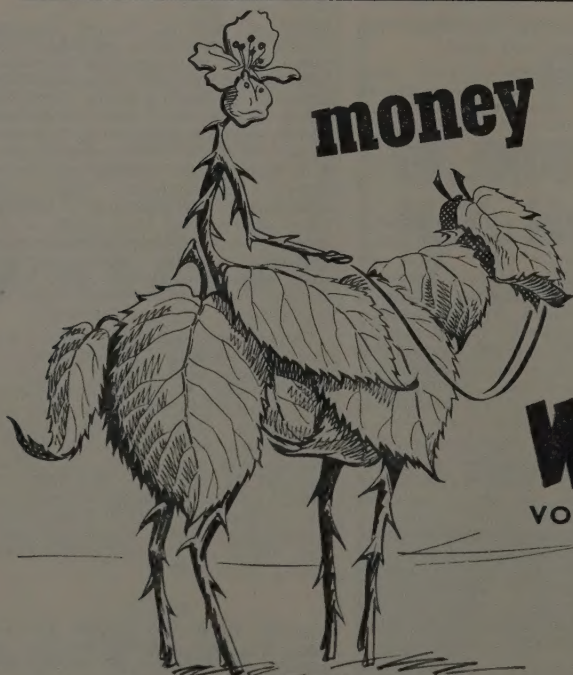
DON'T BUY ANOTHER FOOT OF PIPE until you have investigated . . .

CONTOUR PIPE

Sole Selling Agents
for the Manufacturers
Plastics Division N.Z.
Glass Manufacturers,
Co. Pty. Ltd. Neill,
Cropper & Co. Ltd.



CP 23



money rustler!

If BLACKBERRY has been running wild on your farm, roping in your profits, it's high time you shot it dead with Hi-Vol Spray equipment and

WEEDONE

SPECIAL
2, 4, 5-T
VOLATILE AND NON VOLATILE



Genuine Weedone products are recognised by this sign — make sure you get what you ask for

PRODUCT OF IVON WATKINS LIMITED, NEW PLYMOUTH—HOME OF THE WEEDONE SERVICE

IW.1118

treatment. A 5lb. per acre application reduced plant density in Montgomery red, broad red, and subterranean clovers by 40 per cent. and in white clover by 20 per cent. Later, recovery was good, but the plants were seriously checked for 6 to 7 months. The heavier rates had a more severe effect (see illustration on page 452). Though the seedling clovers were burnt and wilted, subterranean and white clover made nearly full recovery after 8 to 9 months. Montgomery and broad red clovers were severely checked and recovery was poorer than with white or subterranean clover. On sub-mature clovers plant density was considerably reduced by 10lb. and 20lb. per acre applications, but on mature clovers T.C.A. caused only a slight burning.

A characteristic effect of T.C.A. on clovers was that the leaves of the affected plants became folded, thickened, and darkened. They remained in that condition until the plant either died or recovered. When in this state the plants were very susceptible to frost damage. The illustration on page 453 shows affected leaves of Montgomery red clover.

I.P.C.: The rates of application were 1lb., 2lb., and 4lb. per acre at the same times of application as for T.C.A. In both series of trials all rates of I.P.C. were found to have no effect on the clovers at all times of application. Some temporary leaf burn was caused by the aromatic solvent in the preparation of I.P.C. used in these trials.

Summary of Results

Results may be summarised as follows:—

Tolerance of Clovers

In Table 4 the phenol and hormone weedkillers are ranked according to the amount of damage caused to clovers as shown in Tables 2 and 3. The range is from 1 for the preparation doing least damage to 5 for that doing most damage. Preparations causing the same damage at the stage of growth given are indicated by the equal sign.

This table gives a comparison of the effect of the different weedkillers on each clover species at one stage of growth, but does not compare the effect of one weedkiller on all three clovers at different stages of growth. When similar formulations of M.C.P. and 2,4-D are used differences between M.C.P. and 2,4-D are reduced.

Subterranean clover: At the seedling stage this clover was least damaged by M.C.P., followed by 2,4-D and D.N.B.P. It was very susceptible to D.N.O.C. and 2,4,5-T. Once subterranean clover was well established only 2,4,5-T caused severe damage, but the amount of damage was significantly less than when the weedkiller was applied at the seedling stage. Seed regrowth on all plots appeared to be unaffected by the treatments.

Red clover: At the seedling stage red clover is very susceptible to D.N.O.C., esters of M.C.P., and all

TABLE 4—RANKING OF WEEDKILLING PREPARATIONS

Species of clover	Stage of growth	Amount of damage from				
		Ammonium D.N.B.P.	Amine D.N.O.C.	Sodium M.C.P.	Ethyl 2,4-D	Butyl 2,4,5-T
		2lb.	6lb.	1lb.	1lb.	1lb.
Subterranean ..	Seedling	2=	4	1	2=	5
	Established	1=	1=	1=	1=	5
Red (Montgomery) ..	Seedling	2	3=	1	3=	3=
	Established	1=	1=	1=	4	5
White ..	Seedling	1	4	3	2	5
	Established	1=	1=	1=	4	5

formulations of 2,4-D and 2,4,5-T. When red clover is well established the weedkillers are much less harmful and only 2,4,5-T causes a significant depression in clover density. Other trial work has indicated that red clover is the most susceptible of the common clovers to weedkillers applied at the seedling stage, though this finding is not supported by statistical evidence given in this article. The hormone 2,4-D is more toxic to red clover at the seedling stage than to the other clovers at the same stage, and red clover when well established still appears fairly susceptible to 2,4-D.

Observations at Invermay showed little difference in the tolerance of the two strains of red clover to weedkillers. Mature Montgomery red clover appeared to recover better than broad red clover, but Montgomery when young appeared to suffer more growth check than broad red clover (cowgrass), which was more advanced at the time of spraying.

White clover: At the seedling stage this clover was the most tolerant of all the clovers to D.N.B.P. and the most susceptible of all to M.C.P. D.N.B.P. proved to be the most selective preparation for young white clover. Once white clover was well established phenol preparations and salts and amines of M.C.P. and 2,4-D caused little if any damage, but esters of M.C.P. and 2,4-D (particularly P.E.G. 2,4-D) caused a considerable reduction in clover density; 2,4,5-T was very toxic.

Observations at Invermay indicated that white clover showed rapid recovery unless the damage from sprays had been very severe.

Rates of Application

In the majority of these trials no comparison was made of rates of weedkillers. One trial compared the effect of 1lb. and 1lb. rates of four weedkillers, but there was little difference between these two rates in weed control and clover tolerance. Rates of 1lb. and 3lb. per acre of 2,4,5-T were compared, but the effect of 1lb. was sufficient to cause almost a complete kill of clover plants. The effect of T.C.A. was increased in severity as the rates increased from 5lb. to 20lb. Rates of I.P.C. from 1lb. to 4lb. caused no damage except slight burning of clover leaves with 4lb. This effect was due to the aromatic solvent in the formulation of I.P.C. that was used. In other trials a wettable powder form of I.P.C. applied at rates of up to 16lb. per acre caused no damage.

Conclusions

Conclusions from the trials described are:—

1. Preparations of D.N.B.P. are valuable in weed suppression in clovers only when the weeds are young. Once the weeds are more than 3in. to 4in. high D.N.B.P. has little effect on them.

2. For young pastures that contain white clover as the main clover species water-based 2,4-D preparations cause less damage than similar preparations of M.C.P. If the pasture contains red and white clovers, a water-based M.C.P. preparation should be used, as 2,4-D is more damaging to red clover than is M.C.P. to white clover.

3. In mature pastures if weeds can be controlled by water-based M.C.P. preparations, these preparations should be applied, as least clover damage results from their use. Water-based preparations should be used in preference to oil-based esters of M.C.P., 2,4-D, or P.E.G. 2,4-D if weed control results from the use of water-based preparations.

4. Preparations of 2,4,5-T are extremely toxic to clovers at all stages of growth. With 2,4-D this preparation forms a valuable weedkiller for suppression of weeds in playing greens, but if it is used for scrub spraying, spray drift on to pastures should be avoided as far as possible.

5. Both I.P.C. and C.I.P.C. cause little or no damage to clover species. Up to 16lb. of I.P.C. per acre has been applied as a pre-emergence treatment without suppressing clover establishment.

6. T.C.A. should be applied only to mature clovers. It is much less selective on clovers than is I.P.C. or C.I.P.C. Mature white clover is not affected by rates of up to about 20lb. of T.C.A. per acre.

7. Clover damage is most serious in the early establishment stage of a new pasture and for established pastures in winter, spring, and autumn. If hormones are to be employed, difficult-to-kill weeds, such as docks, should preferably be sprayed in summer, when clover damage is of less consequence. The use of 2,4,5-T for controlling gorse in pastures should be restricted to summer. If frost follows spraying, greater clover damage, particularly of red clover, usually results.

8. Clover damage can be reduced by hard grazing before spraying.

Chinese Wisteria is a Beautiful Climber

By F. E. WILKIN, Plant Quarantine Officer,
Department of Agriculture, Wellington

THE lovely Chinese wisteria (*Wisteria sinensis*) is a beautiful, vigorous climbing plant that will thrive in the temperate climate of New Zealand. As the name suggests it is a native of China and the Orient. It was introduced into European countries about 130 years ago.

THE abundant flowers are borne in lovely pendulous sprays which are generally about a foot long and are mauve or lilac. The characteristic butterfly form of the flowers betrays the fact that wisterias belong to the same plant family as peas and beans.

There is a double- or semi-double-flowered form of the Chinese wisteria available in New Zealand which is usually listed by nurserymen as *W. sinensis flore-pleno*. Most people, however, prefer the truly classic single variety, which is on the whole more beautiful than the double form. Also a white-flowered kind (*W. sinensis alba*) is occasionally available.

Few plants look more effective in spring than Chinese wisteria when it is growing along a wall or over a pergola with its profusion of blossom, and it is an ideal plant for these situations, as there is no foliage on it in winter; this allows sun and air to penetrate through the branches and permits situations where the plant is growing to be drier and less shady during the cold season than if an evergreen climber was grown. Wisteria may also be grown on a trellis, and it looks most effective when trained up a tree, as it is a rampant, tall-growing climber. Rambling plants of this kind should not be allowed to grow unchecked up any trees that are valued for their beauty, as they tend to smother the foliage and may eventually kill many branches and even the whole tree. However, trees which do not add to the beauty of a garden, or are otherwise an eyesore, may become one of its most pleasing features when covered with wisteria. The leaves appear soon after the plant begins to flower and are of the feather type, there being 9 to 11 leaflets up to 3in. long along a central leaf stalk.

Pruning

In some situations wisterias may need pruning to keep them within bounds and to train them in a pleasing manner, as they are apt to become a thick tangle of intertwined slender shoots that bear few flowers. It is best to shorten back side shoots immediately after flowering to encourage the formation of flowering spurs for the next season. All unnecessary or superfluous wood should be removed; also leading shoots should be tied and trained carefully to induce the plant



[Douglas Elliott

to grow in the direction desired. All ties should be made so that they will not become tight and strangle the vines later.

In New Zealand wisterias may be grown in almost any district and they are not particular about soil, but they grow best in rich, well-drained garden soil and prefer a sunny, well-sheltered situation; they are, however, not averse to some shade. Transplanting is not easy unless the plants have plenty of fibrous roots. Reputable nurserymen generally supply plants which meet these requirements.

Propagation

Wisterias are often propagated by root grafting on to seedling stocks; if it is desired, however, to raise a few plants for the garden, layering is a very satisfactory method of propagation.

Layering should be done in autumn, and it is a good plan to layer into 6in. to 8in. pots, as this greatly assists transplanting with little disturbance of

the roots. The following potting mixture gives best results for layering: 2 parts of good loam, 1 part of peat or leafmould, 1 part of river sand (all parts are by volume). The pots should be well crocked and plunged in the soil in suitable positions around the selected plant, as this assists in preventing excessive drying out of the pots, and less watering will be needed; good drainage, however, is essential. Select shoots of the current season's growth (one for each pot), give each a twist about a foot from the tip, and place the twisted part on some of the potting mixture about half-way up the pot; place a little coarse river sand on the twist and fill the pot firmly with the potting mixture, keeping the shoot upright and tying it firmly to a rod or bamboo cane placed upright in the pot against it. In the following late summer or early autumn the layers may be partly severed from the parent plant, and later in the autumn they may be removed from the pots and planted into permanent positions.

An Efficient Fattening House for Pigs



EFFICIENCY of pig housing for fattening purposes must be gauged by its effect on food conversion ratio and labour requirement. Further, overhead costs must be spread over the life of the building and hence durability must be considered carefully, particularly when, as today, labour costs enter largely into the first cost of the building. On these counts the pig fattening house erected last year on the Mauriceville farm of Messrs. H. and N. Myers is worthy of study by those interested in securing more efficient results from their pigs. The house is described in this article by A. Longwill, Superintendent, Pig Industry, Department of Agriculture, Wellington.

THE interest which has been stimulated in recent years in the provision of housing for pigs which is effective in maintaining relatively stable temperatures when properly stocked with pigs and properly managed has resulted in some practical designs being evolved by farmers to improve on the housing they have hitherto used.

One of the notable examples of this development is on the farm of the Myers brothers. The house follows closely a ground plan which they had found to be satisfactory from practical experience in their earlier house. The new design, however, reduces the cubic air space in the house, incidentally reducing the quantity of materials to some extent. This saving is put back into better provision of insulation and controlled ventilation so that a fair degree of control over temperature inside the house is possible with

provision of sufficient ventilation to maintain healthy conditions.

Description of Building

The new three-unit house is shown in the photograph at the head of this page. The walls are of 4in. boxed concrete and are plastered. Foundations were dug to solid clay 6in. deep for all outside walls. Subdivision walls are carried on the concrete floor.

The layout of the building is shown in the ground plan on page 460. It is somewhat similar to the New Zealand adaptation of the Harper Adams design described in the June 1954 "Journal" except that the outside yards have been dispensed with, the dunging passage being placed at the side of the sleeping floor with all drainage being taken by a fall away from the trough to the drain along the north side of the building. An apron of concrete all round the building graded to falls and connected to the main drainage system

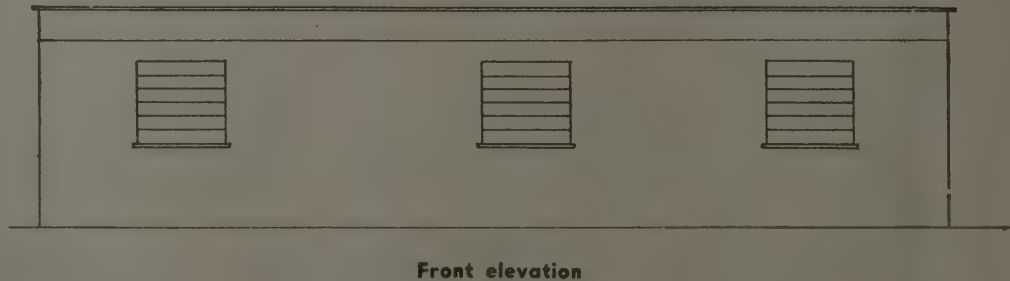
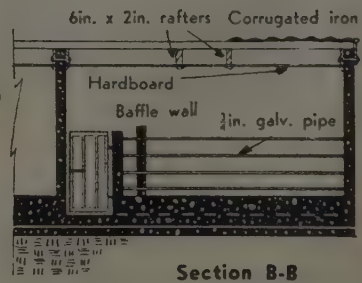
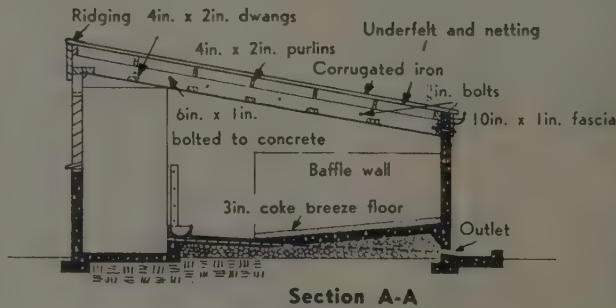
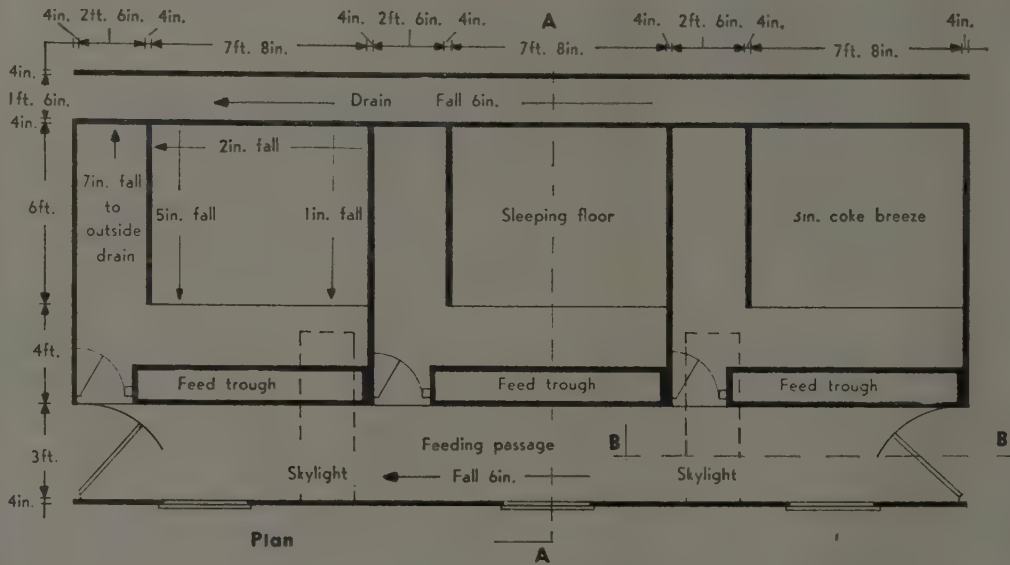
ensures that no water from the walls and roof is allowed to accumulate in puddles near the house.

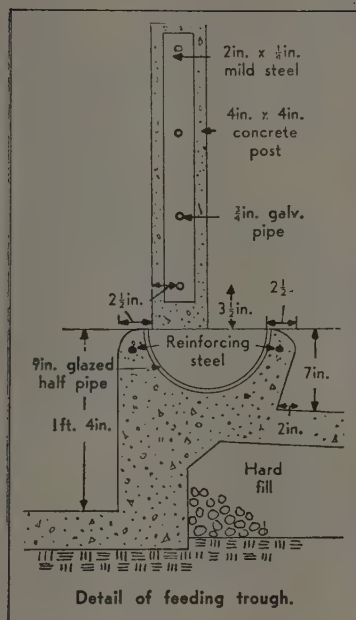
A warning is considered necessary regarding the inclusion of the dunging passage under the roof alongside the sleeping quarters in this design. The house must be cleaned daily to ensure that the passage is kept scrupulously clean and dry. If this is not done, it would be difficult to maintain hygienic conditions in the house, particularly in cold weather.

The dwarf wall between the dunging passage and sleeping area is not taken right up to the roof in this house, but it is felt by the writer that the additional expenditure involved in this would be a good investment. This would tend to make the sleeping quarters cosier in cold weather, particularly where the site is exposed to strong north-westerly winds.

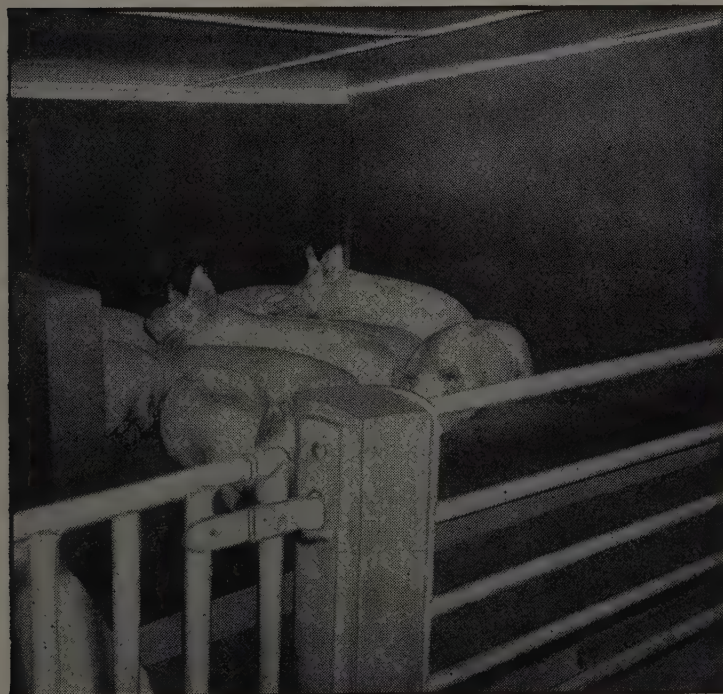
As with the Harper Adams design the feeding race in this house has been run along the south side of the build-

HEADING PHOTOGRAPH: A general view of the 3-unit fattening house on the farm of Messrs. H. and N. Myers, Mauriceville.





A view along the feeding race showing the front of the pens.



A pen of pigs on the sleeping floor. The 2in. step at the front of the sleeping area can be seen through the fence.

ing and approximately 3ft. x 3ft. louvre windows are placed in the south wall in front of each unit. This arrangement has suited the site, particularly with regard to drainage, but is also strongly favoured by the Myers brothers for reasons of temperature control. They feel that if the louvre windows faced east or north, as it has been customary to face the open-fronted type of pig house, the totally enclosed house would be too hot during summer. Houses of the enclosed type are being built in other districts and facing north or east and so it will be possible to check on this point.

Light is adequate in the building as a result of the inclusion of two corrugated plastic skylights in the roof as shown on the plan. In addition electric lights are provided.

Roof Insulation

The construction of the roof is a good compromise between the requirements for maximum insulation, durability, and reasonable cost. The section A-A on page 460 shows the construction. Under the corrugated iron sheathing a single thickness of underfelt on wire netting is carried on top of the purlins. Dwangs are fitted at 2ft. centres between the rafters and a hardboard lining is nailed to these. All joins and corners are covered with cover strips and mouldings and the whole lining painted with enamelled interior paint which provides a good vapour seal. The 10in. air space between lining and underfelt is closed up at each end, and unless the lining was vapour sealed there would be danger

DIGS POST HOLES

at the rate of

**2 FEET
PER MINUTE!**



INDISPENSABLE TO ALL FARMERS & GROWERS

Speed up hole digging and save energy as well as time. When erecting fences, planting trees and in building operations you'll find the Jarrett pays for itself the first few times you use it.

Available in 4", 6", 8" and 10" sizes.

Stocks on hand — order now.

£2 - 11 - 0

IRRESPECTIVE OF SIZE

JARRETT
POST HOLE DIGGER

Made perfectly in New Zealand

BOX 1667, WELLINGTON

Experience tells me—



ELTHAMOL
VETERINARY OINTMENT

is REALLY EXCELLENT for

CHAPS — CRACKED TEATS — BRUISED UDDERS

Sold in 2, 10 and 36 lb. tins — for economy buy the large size.

Prepared under strict laboratory control, by the

N.Z. CO-OP. RENNET CO. LTD., ELTHAM

and obtainable from Stock and Station Agents and Dairy factories

ECONOMY!

**"Only 1½ gals.
per hr. for all
types of work"**

(including giant discing)

David Brown Crawlers

from £1299

f.o.r. main ports

Complete with 6-speed gearbox and 12-speed range, 4-speed PTO, choice of track widths, controlled differential power steering, electric starter, replaceable cylinder liners, force feed lubrication.

Petrol & Diesel engines. Send for catalogue. Wheel models also.



DAVID BROWN

N.Z. Distributors: TODD BROS. LTD., Wellington. Dealers Everywhere.

Todd Bros. Ltd.,
WELLINGTON.

Dear Sirs,

During the 12 months I have owned a David Brown 30T Trackmaster Maintenance apart from a valve grind has been nil and petrol consumption has been only 1½ gallons per hour for all types of work including giant discing.

I have found the track gear and the type of suspension very ruggedly constructed and ideally suited to the rough nature of the country on which I operate.

The six speed gear range and differential type of steering make the machine easy to control on hill country.

J.W., Cheviot.

16th Feb., 1955.

of condensation on the corrugated iron dripping into this unventilated air space.

Ventilation

The louvre windows in the south wall and the horizontal ventilation along the feeding passage are relied on to remove all excess moisture and, up to the present, seem to be adequate.

The outlets from the dunging passage to the outside drain are approximately 30in. x 3in. and these inevitably allow considerable inlet of air at this point. This air picks up moisture in its passage and must be exhausted through the louvres or doors at the ends of the feeding passage. In exposed positions a flat galvanised iron flap hinged over the drainage outlet to lift outward but hanging over the opening to close this and so reduce draught is an addition worthy of trial.

The doors at each end of the feeding passage can be used to control ventilation to some extent and they may be left open during the daytime in hot, humid weather. If they are of the stable-door type, the lower half of each door may be closed when it is not desired to close these openings completely. In cold weather the doors will generally be kept closed, some opening of the louvres being sufficient to provide ventilation. Unless the house can be kept stocked to capacity in cold weather, provision of a door across the feeding race at one of the subdivisions is desirable to enable the house to be shut up to the number of units stocked. In the cold weather of winter and early spring pens of small pigs are not able to warm the whole house to an optimum temperature and careful management is necessary to ensure that they are reasonably comfortable. Bedding would generally be worth while for weaner pigs in cold weather, but it is not always available on North Island farms and also adds to costs, as does artificial heating. These are reasons for emphasising the importance of design and management of the house to maintain warmth and avoid bad ventilation.

The well-insulated house properly stocked can be managed to maintain reasonably stable temperatures without the need for artificial heating while at the same time providing ventilation adequate for the health of the pigs.

Warm Sleeping Floors

As will be seen from the cross-sectional details and the photographs the whole of the floor occupied by pigs is raised above the level of the feeding passage. This gives room for 6in. to 1ft. of hard fill to provide insulation for the floor. The cubic air space of the house which has to be warmed by the pigs is correspondingly reduced.

Fattening pigs should be encouraged to spend as much time as possible lying on their sleeping floor. Though there is still some difference of opinion between research workers on this subject, there appears to be a sound argument for the use of an aggregate in the



Detail of a front fence and gate showing welded construction, bolting to concrete post and subdivision wall, and absence of timber.

sleeping floor which not only has a high resistance to heat transfer but also has a capacity for storing heat. Coke breeze, which has these attributes and also the advantage of being relatively cheap anywhere within reasonable distance of a gasworks, has been used in this house to a depth of 2in. over a concrete base layer laid on the hard fill. The sleeping area is laid with a fall to the front, at which point there is a 2in. step to the feeding floor and to the lower side of the pen as shown on the ground plan. A strong plaster $\frac{1}{2}$ in. thick is laid over the coke breeze. It is preferable to give this plaster a coat of a sealer which will reduce evaporation and ensure correct curing. The floor should be ready for use in a month from laying, but after about 3 weeks the whole floor may be given a coat of a bituminous emulsion paint which should be given a week to dry before pigs are put in. Though this will wear off, it has been found beneficial in reducing wear on the pigs' feet on the new concrete. This wear may cause sore feet and the abrasions may allow access to the tissues by the germs which cause foot-rot.

Front of Pens

The section through the front of the pens in the diagram and the photographs on pages 461 and 463 shows clearly the construction of the front. Boxing is placed to give a rise of 1ft. from the hard fill to the base of the trough, which is boxed in and laid after the concrete floors have been put down. Nine-inch diameter glazed half-tile liners jointed with fused sulphur have been used. The diagram on page

461 shows that a "toe space" of 2in. has been provided in front of the trough in the 7in. rise from the feeding floor. The total height measured from the finished level of the feeding passage is 1ft. 4in. When the liners are concreted into position the top corners are rounded off to reduce risk of injury.

The fence over the trough is formed by five lengths of $\frac{1}{2}$ in. galvanised iron pipe welded to flat 2in. mild steel ends which are drilled for bolting to the wall and gate post. The single vertical brace is effected by welding in short lengths of pipe in the centre of the span. These fronts are easily removed. The gates of welded pipe are hinged to another flat steel plate which is bolted to the gate post by $\frac{1}{2}$ in. bolts which pass right through the reinforced post and hold both plates. Bolts through the subdivision walls hold the other end of the welded front.

The bottom pipe is placed so that its centre is 2 $\frac{1}{2}$ in. back from the inner surface of the trough liner and 3 $\frac{1}{2}$ in. above the level of the edge, giving a space of approximately 4in. to pour the feed into the trough from the feeding race and 6in. for the pigs to get their heads into the trough. This, with the provision of the toe space, ensures that the pigs can eat comfortably without putting their feet into the trough. This is shown well in the illustration on page 464.

The elimination of timber from fittings accessible to pigs is noteworthy, as it not only makes for more hygienic conditions but assures more lasting and economical housing.



Pigs feeding at the trough. There is ample room for 8 baconers, and the position of the bottom rail gives plenty of pouring space and helps to keep the pigs' feet out of the trough.

Management

No matter what type of pig house is built the success achieved with it depends chiefly on management. The reasons lying behind any particular design and the particular methods of management attaching to it should be carefully studied before a decision to build is made.

A feature of the design under discussion is that the area set aside as a dunging passage is:—

- (a) Under the roof; that is, inside the enclosed space which must be kept warm yet well ventilated.
- (b) Only 2ft. 6in. wide.

It is felt by the writer that this may lead to some problems unless the system of management is along the lines adopted by the authors of this design. Pigs are trained to use the dunging area by restriction of the sleeping floor with the use of a partition when required. Twice-daily cleaning is practised. Considerable importance is attached to this, and good falls on the floors are important. Cleaning is done by pressure hose and all that is normally necessary is a very short play of the hose down the dunging passage. This is done at each feeding time before the feed is given. The fall on the passage ensures that surplus water runs away quickly and the surface is soon dry. In hot weather, however, a spray of water can be given over all concrete surfaces to help reduce air temperature by evaporation. Use of excess water is carefully avoided in cold weather.

General cleanliness is promoted by careful feeding in the first instance. Feed ample for rapid growth is allowed, but it is restricted below the level at which pigs begin to scour. Twice a day feeding is practised and

excellent food conversion ratios are obtained.

The width of the dunging race is designed to conform with the fattening policy on the farm, which is to take pigs only to porker or light baconer weight. A 3ft. 6in. dunging race would be recommended if the main aim were baconer production. It would then be more important to take the wall between sleeping quarters and dunging race right up to the roof. However, since an extra 1ft. in width increases the total cubic air space of the house by 65 cub. ft. per unit, the effect of this in making it more difficult to maintain warmth in cold weather must be realised. A house including the wider passage in one-third of its units would probably be a worthwhile compromise.

Alternatively it would be advisable to use a portable kennel approximately 4ft. x 4ft. and 2ft. high which could be fixed in position on the sleeping floor for a time when small pigs are introduced into the house. The litter of weaners could keep themselves warm in this restricted air space and, provided the rest of the sleeping floor is boarded off from them, they would soon learn to use the dunging passage.

Pigs are drafted in and out of the house through the feeding race and the 20in. wide gate in the front of each pen. The house must therefore be placed to communicate directly with the main race of the piggery so that pigs can be handled with the minimum of effort. The main feed point is close to the door at one end of the house. In a larger fattening house provision of a central feed point should be considered.

The gate in the front of each run restricts the trough space to 8ft. This

is appropriate to the area of the sleeping floor. If, however, the sleeping floor occupies the whole of the area to the trough, 10 or 11 pigs could be accommodated to baconer weight and a full-length trough would be required. The idea used in the original Harper Adams design of sliding pipes of different diameter instead of a gate, with a temporary ramp to get pigs over the trough, would then be worth consideration.

In this article the writer has described one efficient fattening house design and has discussed some of the essential points of management. It is emphasised that those wishing to build new piggeries should discuss their requirements with officers of the Department or Pig Councils so that they are sure of obtaining a satisfactory design for their requirements and also are fully informed on the management aspects without which full success cannot be assured.

Dipping of In-lamb Ewes

THE discovery of lice in ewe flocks when the ewes are heavy in lamb has posed a serious problem for many farmers. Usual dipping practice on many farms leads to rough handling of ewes, and farmers confronted with lice on their in-lamb ewes have been concerned about the possibility of losses during dipping or from pneumonia if cold weather follows dipping. On the other hand, if the sheep are not dipped before the lambs are born, the lambs too will soon become infested. Lousy lambs do not thrive, and in the meantime the few lice on the ewes will have multiplied rapidly and reached serious proportions with consequent serious effects on the ewes and their wool.

It is therefore apparent that the farmer must dip as soon as possible. He is well advised to prepare his dip immediately, wait for a suitable day, and then begin dipping early in the morning. Ewes heavy in lamb must be handled with extreme care. Because of lice infestation ewes have been dipped within a week of the date when they were due to begin lambing, and the ill-effects or losses have been negligible, whereas it would be impossible to assess the benefits which have accrued.

On many farms where infestations of lice are discovered inquiries reveal that the farmers concerned are not fully conversant with the methods of recharging and replenishing the dipping wash, particularly the B.H.C. types. Some farmers do not know accurately the capacity of their dips. For effective dipping of sheep, farmers must know their dip capacity so that the dipping wash can be the correct strength and they must study the manufacturers' instructions carefully.

—C. A. MARTIN,
Livestock Instructor,
Department of Agriculture,
Tapanui

The Home Orchard in Winter

FOR the home orchardist with established fruit trees pruning is the main work to be done, but the home gardener who is just establishing his orchard is faced with the additional problems of selecting and planting new trees. This article by N. B. Congdon, Horticultural Instructor, Department of Agriculture, Hastings, advises on pruning and home orchard establishment.

A FREQUENT mistake in the planning of a home garden is the planting of too many trees for the space available. When deciding on the number of trees to be planted the orchardist must visualise the trees as they will be when fully grown. Crowded trees will not bear good crops of high-quality fruit. Trees should be planted only if they can be guaranteed full attention in regard to spraying, pruning, manuring, and cultivation.



Completing the pruning of a well-grown peach tree.

[Sparrow

For this reason it is best to plant relatively few, say up to a dozen trees, and make sure they are well cared for.

When a gardener has decided how many trees he can afford space and time for, the important question of what varieties to plant arises. Best results from a home orchard are obtained only when varieties suited to the particular district are selected. Advice on kinds and varieties of fruit trees recommended for different districts may be obtained from offices of the Department of Agriculture. Even though only a few fruit trees are grown, it is possible, particularly by the inclusion of citrus and sub-tropical fruits in the North Island, to have a supply of fresh fruit for most of the year.

Ordering and Receipt of Trees

Orders for trees and plants should be placed with a reliable nurseryman early in the year. Late orders often result in disappointment through non-fulfilment of orders or receipt of a poorer grade or variety of tree.

Trees should be planted in their permanent positions as soon as possible after their arrival from the nursery. If the trees cannot be planted immediately they are received, they should be unpacked and heeled in without delay in a cool position in the garden. Deciduous fruit trees may be planted in autumn, early winter, or spring, and citrus and sub-tropical fruits can be planted from June onward in warm localities, but should

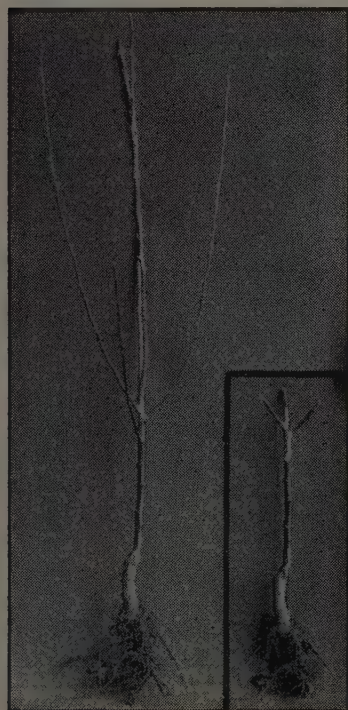
be delayed until early spring in cold areas.

Planting Distances

Planting distances vary with the kind of fruit and its growth characteristics. Large trees such as apples, pears, peaches, plums, apricots, and cherries should be spaced 15ft. to 20ft. apart according to soil and growth conditions. If trees are to be planted in rows, the distance between rows should be the same as that between trees in the row. Planting in this way, on the square system, facilitates cultivation both ways and makes the general maintenance of the orchard easier.

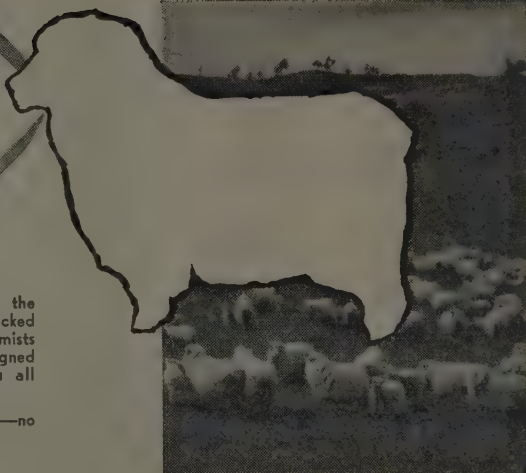
Apple trees are available on East Malling IX dwarfing stock, which are gaining in popularity among home orchardists. Being smaller than other varieties these trees may be planted as close as 6ft. apart in the row with 8ft. between rows. Advantage can be taken of the evergreen nature of citrus trees for ornamental purposes by planting them in conspicuous places around a home garden and even on the front lawn. If planted in a row, citrus trees should be planted no closer than 12ft.

If grown on a fence, Chinese gooseberries should be planted 15ft. to 20ft. apart and passion fruit 10ft. to 12ft. apart. Tree tomatoes can be planted as close as 8ft. apart in the row, but care must be taken to provide these



Left—A 1-year-old branched apple tree as usually received from the nursery. Right—After being planted the tree should be pruned hard back as shown.

**Healthier sheep-
cleaner wool clips
thanks to Young's
sheep dips!**



From the moment you change to Young's Sheep Dips you're on the way to your most successful season ever! Young's Sheep Dips are backed by years of experience and research by a staff of fully qualified chemists in a fully equipped laboratory—ensuring reliable, safe products designed to suit ALL your requirements. No other brand of dip offers you all the features embodied in the range of Young's Dips.

And remember, Young's Sheep Dips are complete in themselves—no further ingredients are required!

★FOR HEALTHIER SHEEP USE—

**YOUNG'S
SHEEP DIPS**

FARMERS!

Call in at your local Farmers' Co-operative Association and see the range of Young's Foot Rot Solutions, Paste Dips, Delfy Sprays and Maggot Oils, guaranteed to give your sheep really efficient protection.

FARMERS' CO-OP. WHOLESALE
FEDERATION (N.Z.) LTD.

P.O. Box 1124 :: Wellington



DORING IMPLEMENT SUPPLIES LTD.

3rd FLOOR, ATLAS BUILDING, GHUZNEE ST., WELLINGTON.

TEL 54-954

P.O. BOX 1179, WELLINGTON.

*Offer you
NEW*

**TRIPLE-CHECK
SERVICE NOW!**

Triple-Check Service
includes general servicing,
detailed inspection and
complete lubrication. It
protects equipment in
storage against rust and
corrosion—gets you off to
a flying start when your
crops are ready next
Spring.

Contact your nearest DORING
Branch for specialised
Service and Spare Parts.

Branches at

Whangarei:	19 Clyde Street	Telephone 4108
Hamilton:	Ellis Street, Frankton Junction	Telephone 75-368
Hawera:	Waihi Road	Telephone 2142
Palmerston North:	311 Main Street	Telephone 544
Nelson:	Bledisloe Avenue, Stoke	Telephone 31-473
Christchurch:	225 Main South Road, Sockburn	Telephone 8471
Gore:	Corner Huron & Halton Streets	Telephone 339
Hastings:	309 Queen Street	
Oamaru:	Corner Thames Highway & Foyle St.	

plants with strong stakes if the site is exposed to winds.

Raspberry bushes may be as close as 2ft., gooseberries 3ft., and currants 3ft. to 4ft. apart. If more than one row is required, 5ft. should be allowed between rows of these berry fruits.

Loganberries should be grown along a fence or trellis with 8ft. to 10ft. between plants.

Strawberry plants should be 12in. to 15in. apart with 2ft. between rows. It may be an advantage to plant strawberries in raised beds to secure good drainage and a free root run.

All berry fruits benefit from being planted where they get full sunshine for ripening.

Planting

Holes for trees should be dug some time before planting. After the topsoil has been removed the subsoil should be broken up with a spade to a depth of about one spit and some of it removed and replaced by topsoil. Well-rotted organic matter such as compost or leafmould and a little animal manure should then be added. Finally, 1lb. of blood and bone manure lightly forked into this new soil at the bottom of the hole will help to provide, with these other materials, a good growing



[Sparrow

Right—A peach tree with the top unpruned as received from the nursery. Left—The top pruned back to three well-balanced main shoots. Note how the roots have also been trimmed.



Left—A young apple tree after its second year's growth from planting. Below—The same tree after pruning. No more than six or seven main limbs or leaders have been selected to form the main framework of the tree and all other growth has been cut away. Leaders have been pruned hard back to an outside bud.



medium for the young roots of the new plant.

Usually it is necessary to trim the roots of young deciduous trees before planting. During carriage from the nursery roots often become broken, and these should be trimmed back to healthy tissue. Citrus trees and subtropical plants are usually received from the nursery with the roots balled, and if it has become hard, the ball should be gently broken. Trees are generally set out slightly deeper than they were in the nursery, but this does not apply to citrus trees, which should be planted at the same depth as they were in the nursery. This depth is indicated by the soil mark on the trunk.

The roots should be arranged gently so that they lie evenly within the bottom of the hole, care being taken that none is doubled back or cramped against the wall of the hole. Any roots that are too long to be arranged satisfactorily should be trimmed back. Topsoil should be filled in directly around the roots and care taken to tread it in so that the tree is firmly fixed. The final layer should be topsoil dug in from around the tree.

essential that they be pruned after planting to 2 or 3 sturdy leaders which should be shortened to about one-third of their length.

The home gardener often hesitates to attempt his own pruning, preferring to have the work done by a more experienced person, but it is far more satisfactory for the home gardener to do this work himself. The main point is to study the manner in which each kind of fruit is produced, on which the method of pruning is largely based. It would be helpful for the inexperienced home orchardist to attend a pruning demonstration by a qualified person before pruning his own trees. Horticultural officers usually hold pruning demonstrations during winter in most of the main centres and these should be of great benefit to home gardeners. The main points to consider in the pruning of each kind of fruit are given here.

Early Pruning

For the first 4 to 6 years in the life of deciduous fruit trees the primary object is to produce a sturdy framework, and during this period fruiting should be allowed only to an extent that does not interfere with necessary growth. This applies to both pip and stone fruits and is a point which is

Pruning

To give deciduous trees a good start for their first growing season it is

The OLIVER "OC-6" THE ONLY CRAWLER TRACTOR AVAILABLE WITH 3-WAY POWER! INCLUDING DIRECT DRIVE P.T.O.!!

Independently controlled power take off saves time, saves crops, saves cost . . . on any kind of P.T.O. work.

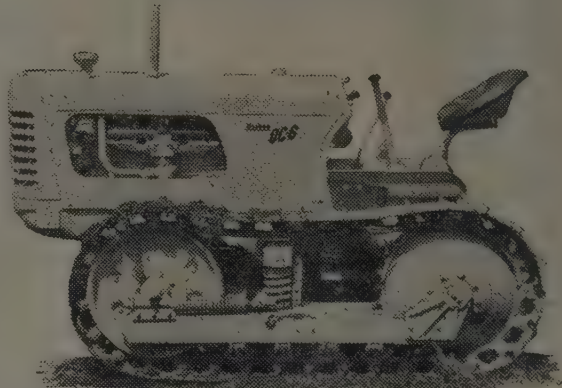
Chief among the special units in the 'OC6' is the Independently controlled Direct Drive Power Take-Off that eliminates two-thirds of the tiresome declutching and re clutching, and all the gear shifting in normal power take-off operation.

It is possible to stop forward motion of the tractor (by stepping on the tractor clutch) without interrupting the operation of the power driven machine. It is also possible to engage and disengage the P.T.O. without stopping the forward motion of the tractor. Oliver independently controlled P.T.O. is powered directly from the engine flywheel through the hollow drive shaft, and is totally independent of the transmission clutch. It is equipped with a separate clutch, controlled by a convenient hand lever near the tractor seat.

Use of this unit often eliminates the need for an auxiliary engine on power driven equipment!

The 'OC6' is built in four track widths—32, 42, 60 and 68 inches.

33 Drawbar HP — 6215 pounds pull at 1.83 m.p.h.



N.Z. DISTRIBUTORS:—

FREDERIC W. SMITH LTD.

8-12 The Terrace,
WELLINGTON.

144 Carlyle St.,
CHRISTCHURCH.

THERE IS AN OLIVER DEALER IN YOUR DISTRICT



*WALLACES Bring
Milker Prices* **DOWN**

. . . by passing on reductions to the farmer. You can save many pounds on the purchase of your next milking machine if you investigate this opportunity which is made possible by more efficient production methods, savings on purchase of materials and increased sales with resultant lower overhead expenses. In justice to yourself you **MUST COMPARE** these prices before purchasing, as WALLACE'S PRICES cannot be beaten.

POST THIS COUPON NOW!

Messrs. D. McL. Wallace Ltd.,

P.O. Box 9010, Newmarket.

Please send me full details of the Wallace Super Milker.

Name

Address

WALLACE SUPER STANDARD MILKER

RELEASER MODELS	2 COW	3 COW	4 COW	5 COW	6 COW
SINGLE UNIT	£140	£160	£182	£210	£232
DOUBLE UNIT	£164	£197	£235	£270	£304

WALLACE SUPER STREAMLINED MILKER

RELEASER MODELS	2 COW	3 COW	4 COW	5 COW	6 COW
SINGLE UNIT	£158	£179	£202	£230	£252
DOUBLE UNIT	£182	£216	£255	£290	£324

Quotations on request for mechanical releaser and milk-pump units, also stainless steel components.

D. McL. WALLACE LTD.

HEAD OFFICE: NEWMARKET AUCKLAND

Branches at:—

Hamilton, Thames, Te Aroha, Matamata, Whakatane, Rotorua, Whangarei, Dargaville, New Plymouth and Stratford.

South Island Representatives: T. H. Phipps & Son., P.O. Box 722, Christchurch.



Left—A typical home orchard tree that had been pruned by the owner. Right—The same tree after being pruned to remove spent fruiting wood and crowded limbs. [Sparrow]

often overlooked by home orchardists who by cropping trees too early prevent them from attaining a strong framework.

After the first year's growth the main limbs or leaders can be chosen. About five of the best placed and strongest leading shoots should be selected and the balance cut away. The remaining leaders should be shortened back to about one-third of their new growth and pruned to outside buds to increase the spread of the tree. Hard pruning at this stage is necessary to promote strong, vigorous growth. The mature tree should eventually possess no more than six or seven leaders.

Fruiting arms are limbs which extend outward from the leaders and which will eventually carry the bulk of the fruiting wood of the bearing tree. At the next year's pruning potential fruiting arms can be chosen from one or two lateral growths suitably placed on each leader. These as well as the leaders should be shortened back to an outside bud and again all other growth removed. As the tree becomes older the leaders and fruiting arms become furnished with laterals, twigs, and spurs which constitute the fruiting parts of the tree.

Pruning of Bearing Trees

Pip Fruits

Apple and pear trees fruit on laterals and spurs 2 years old and older. Fruiting wood is produced in a cycle. A lateral shoot is produced and this, if left unpruned, forms spurs along its length. These spurred laterals by branching and producing further laterals eventually, after 5 or 6 years of fruiting, become spent and are then removed entirely to make way for a new lateral to begin the cycle again. Treatment throughout this 6-year cycle therefore consists of:—

1. Cutting out most of the old and exhausted fruiting wood to promote new growth.

2. Shortening back present healthy fruiting wood to preserve its vitality and to prevent overcrowding.

3. Thinning out surplus 1-year-old growth not required for future fruiting wood. The remaining young growth should be left unpruned for the first year to help the formation of fruit buds during the next season as already described. Young growth at the ends of leaders and fruiting arms should be shortened each year to ensure strong growth at these points of the tree.

Peaches and Nectarines

Peach and nectarine trees fruit only on lateral growth made the previous season. Fruiting laterals, if not pruned off after their first year of bearing, produce weaker and shorter annual wood each successive year until, if they are completely neglected, only a few weak fruit buds develop at the ends of long, thin shoots. Correct pruning therefore consists of the removal of the 2-year and older laterals to induce new growth and also the thinning out of 1-year-old wood where necessary to prevent overcrowding. Where the 1-year-old wood is very plentiful, as on young, vigorous trees, about half of it should be removed and then the next winter the remaining laterals which by then will have fruited and be 2 years old will be pruned off to allow for the new growth meanwhile produced.

Failure to cut away sufficient lateral growth results in the lower parts of the tree becoming devoid of fruiting wood and all the new growth being at the top of the tree. On such trees the leaders should be shortened sufficiently to cause new growth lower down and so refurnish the tree.

Plums, Apricots, and Cherries

Plum, apricot, and cherry trees fruit mainly on spurs of 2-year and older wood. Pruning consists in the main of thinning out old and exhausted fruiting spurs and laterals to promote new, healthy growth.

Raspberries and Black Currants

Raspberries and black currants bear their fruit on the previous season's growth. All canes or branches that have cropped during the previous season and any of the new season's canes or growths that are weak or diseased should be removed at ground level, strong young wood being left for fruit production. Pruning can be done soon after the fruit is harvested.

Gooseberries and Red Currants

Gooseberries and red currants bear their fruit on spurs on 2-year and older wood. Pruning during winter consists of the removal of old fruiting spurs and the thinning out of bushes to promote strong, healthy growth.

Citrus

Pruning of citrus trees is not necessary to the same extent as for deciduous trees, but a certain amount should be done, particularly to lemon trees. Young trees should be encouraged to produce a strong framework, and treatment of bearing trees consists mainly of thinning out crossing laterals and pruning out all dead, dying, and diseased wood and any heavy upright water shoots. Most lemons are pruned in spring when the danger of frost is over, but pruning of oranges and grapefruit is usually delayed until the fruit has been harvested.

Tree Tomatoes

Once the framework is established a young tree tomato tree requires pruning to produce strong, new growth

each spring. The fruit is borne on the current season's growth; hence, if left unpruned, the fruiting wood gradually extends outward from the ends of branches and laterals, leaving the centre more or less barren. This causes the fruiting wood to become less vigorous, resulting in reduced fruit quality, and many breakages occur because branches and laterals cannot carry the weight of the crop.

Tree tomatoes may be pruned at any time from early spring up to October or November. Large branches should first be thinned out where necessary to prevent overcrowding and the remainder shortened back toward their bases to promote strong, new growth. Dead wood should also be cut back to healthy tissue. Then spent fruiting wood should be shortened to encourage new growth.

Passion Fruit

Passion fruit vines should be pruned during spring, preferably in October. Pruning is necessary to keep the vines

open and vigorous. If they are left unpruned, a mass of tangled growth usually results, leaving little possibility for the penetration of sprays, which are important to control diseases and pests. The passion vine bears its fruit on the current season's growth; thus, if the vine is left unpruned, the bearing surface is further and further removed from the main stem and adjacent vines become intertwined. This results in reduced vigour of the plant and quality of the fruit. The orchardist should keep the vine as open as possible by shortening back the original leaders (or main runners) and constantly pruning off the worn-out laterals (or side growths) each to a bud near its base. When leaders are being shortened they should always be cut back to a young side growth, because older leaders tend to die back if cut to a dormant bud.

Chinese Gooseberries

Fruit of Chinese gooseberries is borne on the current season's growth, produced from the first four or five

basal buds of 1-year-old laterals which have grown from the main vines. Pruning consists of the removal each winter of about half of these 1-year-old laterals, shortening the remainder to between 4ft. and 8ft., and tying them down in a bow shape. The growths from laterals tied down the previous winter should be shortened to their first four buds for fruiting the following season. This may be done during winter pruning, but is best delayed until January. Fruiting laterals tied down 2 or 3 years previously should be cut back to the main vines to allow the new, vigorous laterals to take their places.

If a vine, through neglect, has become out of control and developed a tangled mass of growth, drastic thinning out of all wood is the only way to re-establish an orderly framework.

Spraying

Winter spraying is very important in the control of scale insects, aphides, and red mite eggs. Winter oil at 1½ to 1½ pints to 4 gallons of water should be applied to all deciduous fruit trees and to berry fruits except strawberries while they are dormant.

Ruakura Farmers' Conference Week

THE seventh annual Farmers' Conference Week of the Department of Agriculture's Animal Research Station, Ruakura, will open at Ruakura on Tuesday 14 June and will continue until Friday 17 June. The programme arranged for the Conference comprises papers by leading New Zealand agricultural research workers and experts in marketing and management in primary industry.

A feature of the week, as in other years, will be the field day on Wednesday. Farmers will be able to inspect the sheep and dairy sections at Ruakura, the New Zealand Dairy Board's Artificial Breeding Centre at Newstead, and the Ruakura Hill Country Research Station. Buses will circulate continuously on a fixed route (including Newstead), along which a wide variety of demonstrations will be arranged. Visitors will thus be able to see as much or as little of each demonstration as they wish. On the same day sheep farmers may see the Hill Country Station at Whatawhata.

On Wednesday evening in a session Question Time at the Ruakura Staff Centre farmers will have an excellent opportunity to discuss practical farming problems. In the chair will be Dr. C. P. McMeekan, Superintendent, Ruakura Animal Research Station.

Of particular interest, too, should be an address on Thursday evening entitled "The Problem of Farm Costs". The speaker will be Mr. A. H. Hayward, chairman of directors, New Zealand Co-operative Dairy Co. Ltd.

Dr. McMeekan will give two papers at the Conference. Among other speakers will be Mr. F. G. Knight, acting manager, W. and R. Fletcher (N.Z.) Ltd., Mr. N. Thompson, general manager, Auckland Farmers' Freezing Co. Ltd., Mr. A. H. Ward, general

manager, New Zealand Dairy Board, Mr. K. D. Watt, head of the wool department, Mr. M. W. Cross, lecturer in farm machinery, and Mr. D. G. Bowler, drainage advisory officer, all of Massey Agricultural College, and Dr. J. P. James, director of artificial breeding, New Zealand Dairy Board.

An outline of the programme is as follows:—

SECTION FOR SHEEP FARMERS

(Tuesday 14 June)

Morning: "The Principles of Efficient Beef Production" (J. S. MacDonald); "The Performance of Beef Cattle on Fat Lamb and Hill Country" (D. E. K. Walker); "The Use of Hormones to Control the Time of Lambing and the Lambing Percentage" (L. R. Wallace).

Afternoon: "Face Cover and Productivity in Sheep" (I. J. Inkster); "Marketing the North Island Wool Clip" (K. D. Watt); "Some Economic Aspects of Developing Hill Country" (R. H. Scott).

Evening: Symposium on "Marketing of Beef" (F. G. Knight, N. Thompson, and M. A. MacDonald).

SECTION FOR ALL FARMERS

(Wednesday 15 June)

Field day.
Evening: Question Time (C. P. McMeekan).

(Thursday 16 June)

Morning: "New Machines and Methods for Oversewing Pastures" (M. W. Cross); "Planned Farm Drainage" (D. G. Bowler); "Common Misconceptions about Facial Eczema Control" (C. P. McMeekan).

Afternoon: "New Slants on Animal Breeding" (P. J. Brumby); "Copper in Pest Development" (I. L. Elliott); "The Ruakura Diagnostic Section" (D. C. Dodd).

SECTION FOR DAIRY FARMERS

Thursday evening: "The Problem of Farm Costs" (A. H. Hayward).

(Friday 17 June)

Morning: "The Changing Pattern of Herd Improvement in New Zealand" (A. H. Ward); "Breeding for Production" (C. P. McMeekan); "Feeding for Production" (L. R. Wallace).

Afternoon: "Efficient Milking" (W. G. Whittlesome); "Increased Production through Disease Control" (J. C. Gerring); "Can Mastitis be Controlled?" (N. R. McDonald); "Controlling Infertility" (J. P. James); "Leptospirosis in Dairy Cattle" (D. C. Dodd).

"Carpet of Grass"

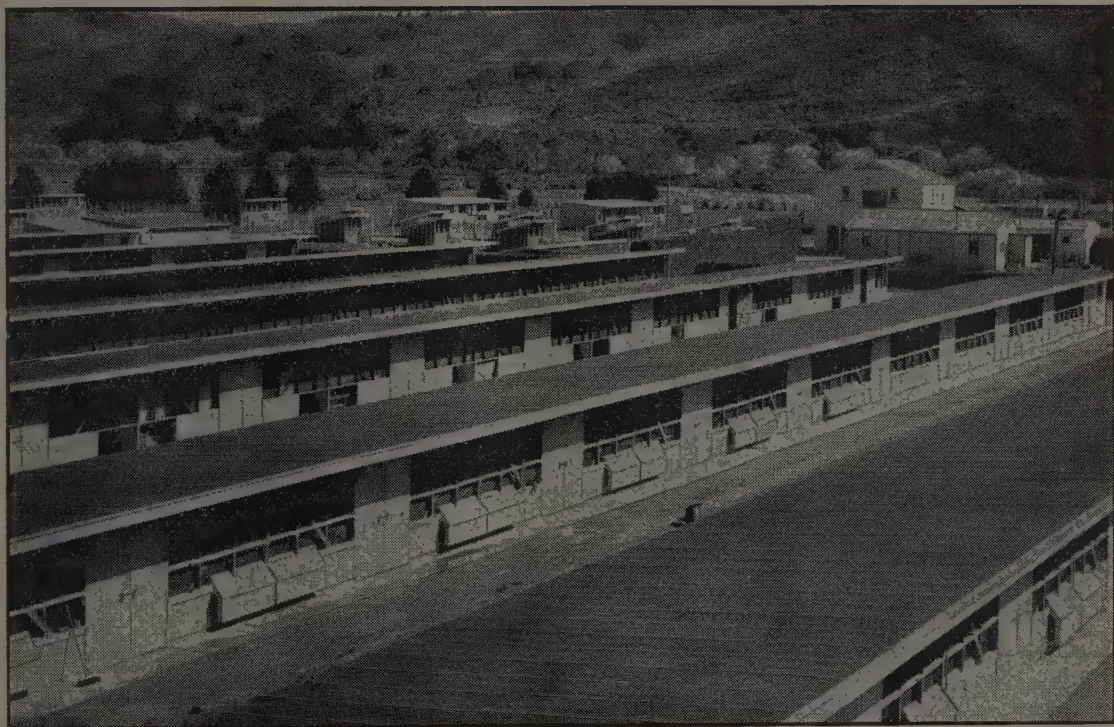
THE film "Carpet of Grass", a 30-minute documentary showing the progress of grassland research in New Zealand, is to be screened in turn at public theatres in Christchurch, Wellington, Dunedin, and Auckland in association with the film "Modern Times".

"Carpet of Grass" is a tribute to the work in grassland improvement of Mr. A. H. Cockayne, late Director-General of Agriculture, and Sir Bruce Levy, until recently Director of the Grasslands Division of the Department of Scientific and Industrial Research. It should do much to create public interest in the importance to primary production of co-operation between the research worker and the farmer. The dates of screening in the four centres are: Christchurch, 6 May to 12 May; Wellington, 3 June to 9 June; Dunedin, 24 June to 30 June; Auckland, 19 August to 25 August.

Farmers' Week in Taranaki

A FARMERS' Week will be held at the Department of Agriculture's Waimate West Demonstration Farm at Manaia, Taranaki, on 24, 25, 26, and 27 May. The Week will begin at 10 a.m. on the opening day with an inspection of the farm, and talks on dairying, sheep farming, and general farming subjects will be given by officers of the Department of Agriculture and others between 10.15 a.m. and 10.15 p.m. on the other days. Films will be shown each night and in the last hour on each of the first three nights the speakers for the day will answer questions on the day's subjects.

Sixth Laying Trial of Prospective Poultry Breeding Stock



THE sixth breeders' laying trial held at the Department of Agriculture's Poultry Demonstration Plant, Upper Hutt, started on 22 February 1954 and ended 48 weeks later on 23 January 1955. The trial was run in two sections, the first section being for pens of 20 pullets per pen and the second for pens of 10 pullets per pen. There were 27 pens in the first section and 4 in the second, giving a total of 31 pens containing an aggregate of 580 pullets. This was 5 more pens and 60 more pullets than in the 1953-54 trial. In this article F. C. Bobby, Superintendent, Poultry Industry, Department of Agriculture, Wellington, gives a full report on the results of the 1954-55 trial.

ON several occasions poultry breeders with comparatively small flocks of birds made representations to the Department that a section be started in the trial for pens of 10 pullets. It was considered that 20 pullets was too many birds to take from these small flocks. Consequently it was decided that breeders with not more than 200 birds in their flocks would be permitted to enter not fewer than 10 pullets and a section was established for these breeders accordingly. Four pens only were entered in this section for the 1954-55 trial, but the number has increased to 8 pens for the 1955-56 trial, which started in February last.

The trial under review consisted of 15 pens of Australorps, 13 pens of White Leghorns, 2 pens of Rhode Island Reds, and 1 pen of Black Orpingtons. All the pullets arrived in good condition, though as in previous

years the quality of the stock varied considerably. Once again one pen developed coryza after a few weeks and was withdrawn and returned to the owner.

Management

No change was made in the management as compared with previous years. All pens received wet mash and grain for 6 days of the week and an increased grain ration only on Sundays. Greenfeed was fed daily and in addition fish oil was incorporated in the mash as an additional vitamin supplement. The formula for the mash fed was:—

	Lb.
Bran	22
Pollard	20
Wheat meal	24
Ground oats	7
Maize meal	10
Meat meal (58 per cent. protein)	15
Common salt	1
Ground limestone or oyster shell dust	1
	100

To each 100lb. of mash was added $\frac{3}{4}$ pint of a fish oil containing 2000 international units of vitamin A and 200 units of vitamin D per gramme of oil.

The grain mixture fed early morning and late afternoon consisted of:—

	Lb.
Wheat	1,000
Barley	150
Oats	160
Maize	200

1,510

HEADING PHOTOGRAPH: The Department of Agriculture's Poultry Demonstration Plant at Upper Hutt, where the laying trial was carried out.

Once again it was found unnecessary to increase the maize content of the grain mixture after the flush egg production period. As in the 1953-54

HAMILTON

LIGHT AGRICULTURAL LOADERS

Specially designed for 'Farmall' M & C Tractors

You will be amazed at the number of uses you will find for the Hamilton Loader. Takes the back-break out of all loading and lifting jobs. The Hamilton Bucket will load 6 cub.ft. at a bite—gravel, crushed rock, limestone, anything around the farm is easy to the Hamilton loader. It will lift 1500 lb. to a height of just under 11 ft. while allowing maximum vision and no obstructions to your control. This loader is specifically designed to be useful in construction work, excavating, and other hard-lifting operations around your farm.



ATTACHMENTS

Also available are a series of attachments which can be quickly and easily changed. These are Dozer Blade, Push-Off Stacker, and Hay Sweep.

This line of Hamilton equipment will give you greater efficiency, better work, faster work. It's tallmade for Farmall Tractors.



Manufactured by

C. W. F. HAMILTON & CO. LTD.

Sold and Serviced throughout N.Z. by
INTERNATIONAL HARVESTER COY.

VET-OSTELIN

will prevent ill-thrift (due to lack of Vitamin D) and ensure increased weight gain and full vigour during the winter months.

Vet-Ostelin is a product of Glaxo Laboratories who, in 1924, manufactured the world's first commercially available Vitamin D concentrate. Their experience in vitamin production, exclusive method of stabilising Vitamin D, and strict laboratory control ensure that each dose of Vet-Ostelin is fully effective.

To maintain the integrity of the product, each pack of Vet-Ostelin includes a date beyond which the preparation should not be used.

DRENCH

Bottles of 16oz. enough for 32 sheep.
Tins of 40oz. enough for 80 sheep.
Tins of 1/2 gal. enough for 160 sheep.
Tins of 1 gal. enough for 320 sheep.

TABLETS

Bottles of 25 enough for 25 sheep
Tins of 100 enough for 100 sheep
Tins of 300 enough for 300 sheep

INJECTION

For use with standard injection equipment.
Sterile bottles of 540cc. enough for 270 sheep.

*Available from
your usual farm
supplier!*

VET-OSTELIN

CALCIFEROL VITAMIN D.

GIVEN IN AUTUMN



Breeder and pen number		WEIGHT (in pounds) OF EACH BIRD AT END OF TRIAL AND SECTION A: 20 PULLETS																				Total for pen (including floor eggs)	Flock-housed average per pen	
		Australorps (minimum weight, 6.2lb.)																						
		6.4	7.0	7.1	6.7	6.9	6.4	6.9	6.4	7.6	5.7	7.1	6.3	6.3	6.8	8.0	6.4	6.4	5.7					
Department of Agriculture	(1)	182	191	218	213	227	192	213	195	147	189	7	235*	140	177	46	159*	122	158			3,402	170.1	
C. Walker and Sons	(3)	6.2	6.8	6.2	6.2	6.2	6.7	6.0	5.7	5.5	4.4	5.8	4.8	5.4	5.6	5.9	5.0	6.1	5.6	5.6	5.2	239	4,246	212.3
Smith, G. L. A.	..	214	238	202	226	215	212	178*	157	257	208*	241*	230*	239	179	210	219	176	225	133				
(4)	6.5	6.7	6.5	6.4	6.5	4.7	5.3	5.2	5.2	5.2	5.1	6.5	5.0	5.1	6.3	4.9	6.1	5.9	5.0					
McCartney, F. K.	(5)	192	227	207	186	190	238*	235*	228	218	200*	199*	3	132*	186	253*	184	130	236*	210				
(6)	6.2	6.2	6.2	6.0	7.1	5.3	5.8	6.0	5.8	5.4	6.4	5.7	6.2	6.2	7.0	5.7	5.6							
Phare, J. R.	(6)	233	234	215	222	161*	219	176	201	189	187*	138	149*	162	172	175	59	201						
(7)	6.5	6.2	6.8	6.2	7.1	6.2	7.0	5.1	6.3	7.4	5.5	6.7	6.2	6.6	4.9	6.2	5.4	6.4	5.8					
Rasmusen, M. A.	(7)	206	205	216	245	182	222	171	248*	149	222*	224	143	246*	224*	194*	236*	209	223*	156				
(8)	6.4	6.5	7.7	6.2	5.8	5.2	6.1	5.2	6.7	5.4	5.8	5.7	4.7	5.3	7.4	5.5	5.8	6.3	5.9					
King, A. E.	(8)	220	206	200	230	18	259	158	169	28	209	118	202	222	202	126	186	192	84	251				
Burch, C., and P. H.	(9)	6.4	6.4	6.2	6.2	6.8	6.2	6.2	5.8	7.0	5.4	5.4	7.2	7.5	7.0	5.7	5.2	7.2	5.8					
(10)	219	225	217	222	213	194	196	142	158	222	203	55	133	179	139*	118	163	222						
Greendale Poultry Farm	(10)	6.6	6.2	6.2	6.8	6.0	6.2	7.0	6.4	5.9	6.0	6.6	5.2	5.3	7.2	5.7								
(11)	229	194	220	214	200	213	168*	170	134	203*	172	2	251*	193*	135									
Coman, F. J.	(11)	7.9	8.1	6.3	7.0	6.3	6.2	6.6	6.8	5.7	6.8	5.6	5.6	7.9	5.7	5.6	4.7	5.2	5.8	5.0				
(12)	6.4	6.6	6.2	6.7	6.2	5.5	5.8	5.5	5.7	5.5	4.9	5.4	5.5	5.4	6.2	5.3	5.4	4.9	4.2					
Willers, R.	(12)	184	200	206	224	220	238*	176	206	228	134	207	219*	219	174	175	215	73	249*	192				
(13)	6.2	4.6	5.7	4.9	5.2	5.4	7.5	6.4	6.2	5.9	7.0	6.2	5.8	6.7	5.5	6.4	6.1	6.0	4.5					
Smith, A. J.	(13)	211	260*	232	208*	206*	149	206*	180*	220*	183*	155	170*	182*	156	152*	140*	37	4	183*				
Thorley, J.	(14)	6.2	6.5	7.4	6.4	6.3	6.6	5.1	6.3	6.5	5.8	5.7	6.4	6.6	7.4									
(15)	200	218	183	203	189	211	194	239*	160	121	123	141	119	178										
Siddall and Son	..	6.8	7.1	6.4	6.3	6.4	6.2	7.7	5.2	6.6	5.6	5.2	4.8	6.9	5.9	6.2	6.9	7.6	5.7	5.5				
(15)	210	189	188	182	208	217	172	198*	109	201	174	154			214	260*	181	2	205	187				
Rhode Island Reds (minimum weight, 6.2lb.)																								
Bromley Park Ltd.	(16)	6.6	5.4	5.7	4.3	5.7	5.7	5.5	5.3	5.8	5.7	5.8	6.2	6.6	6.3	5.7								
(17)	191	199	163	129	162	2	118	112	204	204	104	111	171*	176	204									
Craig, L. W.	(17)	6.2	5.8	5.1	6.1	5.4	4.8	5.5	5.9	6.1	4.9	5.4	6.0	4.6	5.1	4.9	5.9	5.7	5.6					
(18)	162	133	148	156*	204	207	199	168*	226	141	67	103*	154	183	140	225	161							
White Leghorns (minimum weight, 4.7lb.)																								
Pen 18	..	4.7	4.7	4.7	4.4	4.3	4.3	3.8	4.1	4.3	5.1	4.4	4.5	3.8	4.6	4.6	4.0	4.4	4.4	4.1				
(19)	181	206	182	223	142	157	200	161	212	60	169	171	145	171*	177	74	217	193*	187	199				
Bromley Park Ltd.	(19)	4.8	5.5	5.4	5.5	4.7	4.9	4.9	5.0	4.3	5.0	4.3	4.3	4.6	4.7	4.5								
(20)	181	166	159	117*	89	158*	173	162	141	162	156*	184	174	132	145									
Burton, A. J.	(20)	4.8	5.3	5.0	4.9	4.8	4.3	6.1	4.0	3.9	4.1	4.8	5.2	4.9	4.8	4.1								
(21)	191	226	228	220	188*	187*	138	116	215*	201	168	147	127	125	176									
Pak Lim, N. G.	(21)	4.9	4.8	4.9	4.8	4.8	4.2	5.0	4.4	3.7	4.8	5.3	4.3	4.6	4.5	4.6	4.5	4.5	4.5	3.6				
(22)	203	232	232	165*	183	203	119	189*	162	101	114	226*	169	166	162	170	189	175	106					
Burch, C., and P. H.	(22)	4.7	5.0	4.7	4.7	4.9	4.5	4.5	5.3	4.7	5.4	5.0	4.2	4.5	5.5	4.5	5.7							
(23)	201	210	190	190	154	155	182*	135	138	112	119	150	176	139	112	155								
Scott, S. T.	(23)	4.7	4.7	5.1	5.1	4.2	5.3	4.3	4.3	4.7	4.1	4.5	4.3	4.7	4.3	4.2	4.8	4.8	4.1	4.3				
(24)	220	194	207	170	172	160	168	223	127	119	190	138	202*	214	204*	159	156	182	174					
Phare, J. R.	(24)	5.7	5.7	5.7	5.1	5.8	5.7	5.4	6.6															
(25)	206	142	135	150	168	158	140	68																
Salisbury's Ltd.	(25)	5.2	5.1	5.2	5.6	4.9	5.3	4.2	5.0	4.3	5.9	5.2	4.7	5.4	5.1	5.7	4.6	4.6	4.9					
(26)	180	182	188	194	177	148	226	137	198	110	142	140	161	147	160	225	123							
C. Walker and Sons	(26)	4.7	4.7	5.0	5.1	4.8	5.3	4.8	5.2	4.7	5.6	4.8	4.4	6.0	4.2	5.3	4.6	5.5						
(27)	224	211	188	180	196	205	197	225	211	177	167	154	170	157	142	168	179							
Hepburn, A. W.	(27)	5.3	3.6	4.4	4.5	4.9	4.5	5.4	4.4	5.2	4.6	5.0	4.9	4.4	4.6	5.0	5.1	4.7						
(28)	206	85	144	141	168	161	162	40	176	176	164	104	147	177	140	143	98							
Downey, T.	(28)	5.2	4.7	5.8	4.5	4.8	5.0	4.8	5.4	4.2	4.5	4.0												
(29)	196	222	198	168	164	125	219	230*	30	154	79													
SECTION B: 10 PULLETS																								
Australorps																								
Drummond, Mrs. C. A.		7.4	6.5	6.2	6.7	6.2	5.7	5.6	5.5	5.5	7.8													
(30)	215	205	189	205	240	224	252	250	121	168														
Black Orpingtons																								
Dudding, E. C.	..	7.3	7.0	5.8	5.8	5.7	5.0	5.0	6.4	6.4	6.0													
(31)	218	216	217	216	171	168	204	194	173	158														
White Leghorns																								
Morris, H. G.	..	5.8	5.0	4.9	5.5	5.6	4.5	4.1	5.0	5.1														
(32)	183	107	164	52	171	108	115	178	116															
Earl, R. H.	..	4.1	4.3	4.6	4.3	4.3	4.4	4.1																
(33)	258	229	208	224	164	238	219																	

Only birds alive at the end of the trial are recorded. Birds which were accredited for breeding are shown to the left of the vertical lines and have their figures for egg production in heavy type. Such birds were required to attain the following standards: (a) Laid 180 eggs in 48 weeks. (b) Weight not less than the minimum weight for the breed. (c) Laid a preponderance of 2oz. or heavier eggs during the periods when eggs were weighed. Pullets which laid a preponderance of underweight eggs (less than 2oz.) have an asterisk against the total of eggs. (d) Be free of any serious body deformity or major breed fault. Where the number of eggs is greater than 180 and egg size and body-weight are satisfactory but the bird is not accredited it may be assumed that the bird has some major fault which made it unfit for breeding.

For farm buildings, warehouses, workshops, garages and factories. Extremely flexible capacity... Can be supplied in 12 ft. to 30 ft. spans... Any length from 30 ft. in multiples of 15 ft. Door and window openings can be located where required.

Ask your local branch of the Loan & Mercantile Company for full details.

* PREFABRICATED
* ALL STEEL
* LOW COST
* QUICKLY
ERECTED!



SMISTOL

ALL PURPOSE
* BUILDINGS

**N.Z. LOAN & MERCANTILE
AGENCY CO. LIMITED.**

Incorporated in England.

Branches throughout N.Z.

WORM CONTROL IN SHEEP

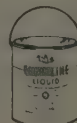
COOPER'S HAVE A DRENCH FOR EVERY PURPOSE

COOPAZINE POWDER provides Phenothiazine in its most economical form. 1lb. drenches 20 to 30 sheep or 10 to 20 cattle. Packed in 1lb. and 10lb. tins, also 56lb. drums.



COOPAZINE LIQUID comes to you ready to use in a convenient tin for carrying. Remains in suspension during drenching. 1 gal. sufficient for 106 to 160 sheep or 53 to 106 cattle. Packed in quarts, 1 gal. and 4 gals.

COOPAZINE TABLETS for quick, clean drenching. 3 tablets for lambs and 5 for adult sheep. Tins 250 or 500.



COOPER'S N.C.A. DRENCH. Containing Nicotine, Copper-sulphate in scientifically combined form. 16oz. bottle sufficient for 160 sheep or 426 lambs, or for 80 to 320 cattle according to age.

COOPER'S FLUKE & WORM DRENCH containing Carbon Tetrachloride, is the recognised remedy for Liver Fluke. $\frac{1}{2}$ and 1 gals.

DRENCHING APPLIANCES available for all types of Drench.

Enquire through your Stock and Station Agent or Merchant, or write

COOPER, McDOUGALL & ROBERTSON (N.Z.) LTD.
ACHILLES HOUSE, CUSTOMS STREET, AUCKLAND (Box 599)



FERGUSON SYSTEM

FERGUSON
The **ONLY** Tractor
with these
5 exclusive advantages!

- Traction without built-in weight.
- Penetration of implement without weight.
- Finger-tip hydraulic depth control.
- Front end kept down.
- Automatic protection of tractor and implement against hidden obstructions.

C. B. Norwood Ltd., Box 298, Wellington.

trial the birds maintained good body condition throughout the 48 weeks.

Egg Production

Unfortunately it cannot be stated that the 1954-55 trial gave entirely satisfactory egg production for any of the breeds entered as compared with previous years. A full summary of the production of all pullets entered in the trial is given. Though the overall production was not as good as for some previous years, the highest producing pen (pen 3, with Australorps) gave a flock-housed average of 212.3 eggs per bird—the highest average so far recorded in these trials. The highest individual scores were recorded by two Australorp pullets in pens 13 and 15 with a total of 260 eggs each. Unfortunately both birds laid a high proportion of eggs under 2oz.

The flock-housed averages per breed were as follows:—

	Pullets	Eggs per bird
Australorp ..	280	177.1
White Leghorn ..	220	142.8
Rhode Island Red ..	40	148.3
Black Orpington ..	10	195.5

Compared on the same basis over the last 5 years egg production per bird in the light and heavy breeds was:—

	Heavy breeds				
1949-50	1950-51	1951-52	1952-53	1953-54	1954-55
149.6	175.0	178.2	174.2	177.0	175.0
		Light breeds			
152.6	151.3	167.7	158.2	145.7	142.8

A Double Success

An interesting feature of the 1954-55 trial was the double success of C. Walker and Sons, of Te Horo. These breeders entered two pens of pullets—one of Australorps and the other of White Leghorns. Both pens secured the highest aggregate egg production among the heavy and light breeds with totals of 4246 eggs for the Australorps and 3461 eggs for the White Leghorns. This is the first occasion on which a breeder has had this double success. Mr. M. A. Rasmussen's pens of Australorps also recorded over 4000 eggs, and a flock-housed average of 200.1 eggs per bird. The third highest aggregate was obtained by the pen of Australorps entered by Mr. R. Willers, of Feilding. This is the fourth year in succession that a pen of Australorps entered by Mr. Willers has been in the first three for highest egg production, a consistent performance for which this breeder must be commended.

Future Breeding Stock

As in past years all birds were handled and weighed at the end of the trial to assess their value as future breeding stock. The primary object of this trial each year is to assist breeders to find suitable stock for the following breeding season. The standards used in assessing the value of these pullets were similar to those used in previous years, including a minimum requirement of 180 eggs per bird in the 48 weeks, a preponderance of eggs to be over 2oz. on the three

occasions when egg weights were checked during the 48 weeks, and pullets to be not less than the minimum weight prescribed for the breed and free of all major faults considered detrimental in a breeding bird.

On these standards the following figures have been obtained from the past two trials for the two major breeds:—

Australorps	1953-54	1954-55
Total number of pullets ..	180	290
Number of breeders selected ..	51	79
Percentage ..	28.3	27.2

White Leghorns

Total number of pullets ..	280	240
Number of breeders selected ..	51	37
Percentage ..	18.2	15.4

These figures indicate that measured by the standard set for egg production, egg weight, body-weight, and general condition a comparatively low percentage of pullets can be confidently recommended for future breeding.

Of the total number of birds for each breed a certain percentage die. Of those pullets which are alive at the end of the trial varying numbers are excluded as future breeders for one or more of the following reasons—insufficient eggs laid, average size of egg too small, and insufficient body-weight. The figures in the table at top right of this page show the percentage of birds which are not recommended for breeding for these reasons.

A study of these figures makes it easier to appreciate why only approximately a third of the Australorps and a fifth of the White Leghorn pullets can be recommended for breeding. Perhaps the most controversial figure is that for minimum body-weight. It is somewhat disturbing that such a high percentage of pullets at the end of their first laying season are not within 1lb. of the minimum weight laid down for a hen of the breeds concerned in the New Zealand Utility Poultry Standards of Perfection. Only a strictly limited number of birds make the optimum weights named in the standards. There is a sharp rise in the percentage of under-weight birds in both breeds for the 1954-55 trial. Those who handled the birds at the end of this trial are satisfied that this does not indicate a lack of condition in the birds; there were many small-framed birds in both breeds.

It is satisfactory to note the fall in mortality in 1954-55, the 9 per cent. for Australorps being the lowest on record for this breed since the trial was started in 1950.

Food Consumption and Cost

The amount of mash and grain consumed by the pullets was recorded throughout the 48 weeks of the trial. Unfortunately it is not practicable to obtain a separate figure for the light

PERCENTAGE OF BIRDS NOT RECOMMENDED FOR BREEDING

	Australorps		White Leghorns	
	1953-54	1954-55	1953-54	1954-55
Percentage mortality ..	13	9	23	19
Percentage of birds laying less than 180 eggs ..	37	31	59	61
Percentage of birds laying small eggs ..	18	17	11	7
Percentage of birds below minimum weight ..	26	40	27	40

and heavy breeds. Following are the food consumption figures, per pullet in pounds, for the past 5 years:—

	1950-51	1951-52	1952-53	1953-54	1954-55
	lb.	lb.	lb.	lb.	lb.
Mash	45.1	47.9	42.4	44.1	40.13
Grain	47.1	46.2	46.7	44.9	43.24
	92.2	94.1	89.1	89.0	83.37

The figures indicate a drop in food consumption for the trial under review. The cost of food per pullet for 48 weeks (cost of mash and grain delivered to the Poultry Demonstration Plant including the cost of the fish oil incorporated in the mash) during the past 5 years is as follows:—

1950-51	1951-52	1952-53	1953-54	1954-55
18s. 2d.	23s. 2d.	23s. 10d.	24s. 2d.	22s. 10d.

The figure of 22s. 10d. per pullet in the 1954-55 trial was arrived at by using the average price of mash and meal for the 48 weeks as £27 10s. per ton and £27 6s. 3d. per ton respectively.

There was a drop in the number of birds which died during the trial in both heavy and light breeds. Figures for the last 5 years are:—

	1950-51	1951-52	1952-53	1953-54	1954-55
	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.
Heavy breeds	10.8	19.4	12.9	15.4	10.2
Light breeds	16.2	14.4	17.1	22.8	19.0

The 1955-56 Trial

The seventh breeders' laying trial started on 21 February with 38 pens or 680 pullets. This is seven pens more than for the 1954-55 trial. Section A (20 pullets per pen) consists of 30 pens and Section B has 8 pens of 10 pullets each. In addition to Australorps, White Leghorns, and Rhode Island Reds there are pens of Black Orpingtons, Barred Rocks, and North Holland Blues. The birds arrived this year in good condition and have made an excellent start with egg production. As a whole these pullets appear to be the best in general appearance so far entered for the trials.

Winter Show Dates

- *31 May, 1, 2, 3, 4, 6, and 7 June—Waikato A. and P. at Hamilton.
- *3, 4, 6, 7, and 8 June—Otago A. and P. at Dunedin.
- 8, 9, 10, and 11 June—Whakatane A. and P. at Whakatane.
- 15, 16, 17, and 18 June—Taranaki A. and P. at New Plymouth.
- 16, 17, and 18 June—Te Kuiti and District A. and P. at Te Kuiti.
- 28, 29, 30 June, and 1 and 2 July—Whangarei A. and P. at Whangarei.

* The Department of Agriculture exhibit will be staged at this show.



Clematis *indivisa*

THE lovely puawananga or native clematis (*Clematis indivisa*) will grow and bloom practically anywhere in New Zealand if it is given good soil and reasonable shelter. The clematis climbs by its leaf stalks and though it may be trained up a shrub or tree, it looks very effective if grown up a trellis or arch over a garden path; the shining evergreen foliage always looks attractive. The roots of this plant must be shaded. A good mulch of straw or even rotted compost placed over the roots makes for success. However, sunlight is necessary for the foliage and upper part of the plant. The pure white star-like flowers are so abundantly produced in September and October that they often entirely hide the handsome leaves.

The flowers shown in the illustration are male. The female flowers are borne on a separate plant and are generally smaller than those of the male plant, which sometimes has flowers up to 4 in. in diameter, and the yellow stamens in their centres add to their beauty; the female plants, however, produce very pretty feathery fruits in autumn which compensate for their smaller flowers.

Pruning of clematis is generally not necessary, but after flowering unwanted shoots may be removed close up to a stem or near a bud; it is a far better practice to train or tie trailing shoots in the direction in which it is desired they should climb. All broken, diseased, or dead wood should be removed, however, as a hygienic measure to keep the plant healthy and vigorous.

If it is desired to propagate a specially good plant or a certain sex, layering would probably be the best method. This may be accomplished by pegging down a trailing shoot about 3 or 4 in. deep in the soil in spring. The wood should be given a twist or slightly notched with a knife at the base of the layer to interrupt the flow of sap slightly and encourage rooting; the layer should then be bent up so that the growing tip is vertical and the soil may then be levelled out around the layer. If the soil used for layering lacks humus, peat or leafmould should be incorporated in it and if it is heavy, coarse, clean river sand should be mixed in. These operations should be carried out some weeks in advance of layering to allow the soil to settle; it is also essential to make sure that drainage is adequate.

When rooting has taken place the layer should be severed from the parent plant and may then be planted in a permanent position in early spring. Seed may be sown thinly in August or September in boxes or beds. An excellent seed mixture may be made as follows:—

2 parts of good loam (sterilised if possible)

1 part of peat or leafmould

1 part of coarse river sand

All parts are by volume. To each bushel of this mixture 2oz. of carbonate of lime and 1½oz. of superphosphate should be added.

After this material has been firmed the seed should be carefully lined out on top and covered lightly with similar material that has been sieved. When watering, place a piece of loosely woven scrim over the soil to prevent the seed being washed out with the watering rose. It is a good plan to cover the soil in the boxes with paper until the seed germinates. The boxes should be placed in a shady place or shaded at first and then carefully hardened off in partial sunlight, care being taken to shade the roots.

When the seedlings are 2 in. or so high they may be lined out into beds in the open until ready to plant in their permanent positions, which is best done in the late autumn or early spring when the ground is not too cold.

The young plants should be mulched about their roots with sawdust or hay.

If desired the seedlings may be pricked off into boxes, the same soil mixture as recommended for seed sowing being used, but with the addition of 1½oz. of blood and bone or hoof and horn fertiliser to each bushel of the mixture. The plants should also be provided with small sticks or canes for support.

Those who do not desire to raise their own plants may obtain excellent, well-hardened plants from any nurseryman who grows native plants.

—F. E. WILKIN, Plant Quarantine Officer,

Department of Agriculture, Wellington.

Propagation of

Seedless Barberry

SEEDLESS barberry has many advantages as a farm hedge and shelter, but is more difficult to propagate than common barberry. It is raised from cuttings and is generally considered a difficult plant to raise, a strike of not more than 50 per cent. of the cuttings set out being quite usual. By using sound propagation practices, however, some nurserymen obtain a regular strike of 80 to 90 per cent. of cuttings. The most successful methods of raising seedless barberry are described in this article by R. E. Yates, Horticultural Inspector, Department of Agriculture, Hamilton.

SOME of the advantages that seedless barberry has over common barberry are:—

1. Virtual freedom from seeding and therefore minimum risk of spreading in hilly or sparsely settled country. Common barberry is scheduled as a noxious weed in some counties.

2. Superior root system of the nursery plant and consequent better chance of initial establishment.

3. The retention of the characteristics of the parent hedge and freedom from the variation usually seen in common barberry hedges which are raised from seed.

4. The ability to send up young canes from the base of the plant, giving a much denser hedge near the base than common barberry, which tends to open up near ground level when it reaches maturity.

It is also claimed that seedless barberry can stand wet or heavy soil conditions better than the common variety, but this is doubtful. In any case no barberry will thrive in wet soil conditions.

Though unrooted cuttings of seedless barberry can be planted in their permanent position, this method is inadvisable because double fencing is necessary and a year is lost in plant growth.

Raising the plants should generally be left to the nurseryman; otherwise

the cuttings should be rooted in beds, where they can be given the best of care with a minimum of effort.

Nursery Site

For best results the nursery bed should be well drained and have the benefit of full sun without being exposed to strong winds. Moderate and light winds do not appear to be a disadvantage.

Frosts will not affect the cuttings, but will damage young, soft shoots after they have started into growth. Planting dates are therefore governed to some extent by the risk of spring frosts and will vary in different districts.

Preparation of the Nursery Bed

If the nursery bed is to be prepared from pasture, the initial cultivation should consist of fairly deep ploughing and discing or cultivating during autumn.

Final preparation consists of cultivation about a week before planting just deep enough to destroy weed growth.

No base dressing of fertiliser is required at this stage, but a side dressing can be applied when the cuttings have formed roots and started into growth. Superphosphate at 3cwt. per acre should be sufficient if the soil is reasonably fertile and has been broken out of pasture. If an old nursery block is used, a mixture by weight of blood

and bone, 2 parts, superphosphate, 2 parts, and sulphate of potash, 1 part, applied at the rate of at least 5cwt. per acre will be necessary for good growth.

Selection of Canes for Cuttings

Cuttings are made from canes of 1- and 2-year-old wood. The canes should be taken from a well-grown, vigorous hedge typical of the variety and preferably at least 10 years old.

May is the best month to take the canes, but this can be delayed until June if necessary.

Normally a vigorous seedless barberry hedge will send up annually from the base of the plant canes 6ft. to 10ft. long. From these mature 1-year-old wood from $\frac{1}{2}$ in. to $\frac{3}{4}$ in. thick should be selected. Two-year-old wood may be used if necessary, but normally there are abundant 1-year canes available on a vigorous hedge.

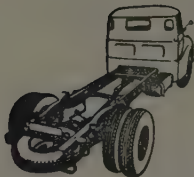
Each cane should give about 12 7in. cuttings; so some 100 canes will be required for every 1000 cuttings.

Any forked or branched canes should be discarded and succulent or tip growth cut off. The canes should then be tied in bundles of a convenient size, usually about 25 canes to the bundle.

Care must be taken to keep the canes, and later the cuttings, facing in one direction, that is, all the tops together. Unless this is done, there is a risk of planting cuttings upside down. Do not depend on trying to pick which is the top or bottom by the direction of the spines or buds, as this method seldom works in practice.

The canes should then be stacked under a hedge or other convenient

Heading photograph by Sparrow.



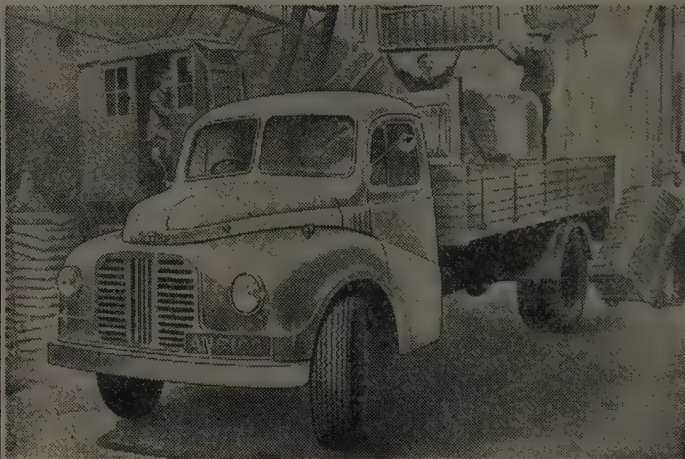
the rugged, reliable **AUSTIN 6-tonner**

A big stout-hearted Austin with the three things you want in a truck—ability to thrive on hard work; economy that means profitable operating; dependability. Technical features include:

● "Driver-comfort" 3-seater cab. ● 6-cylinder high efficiency o.h.v. engine developing 96 b.h.p. at 3,200 r.p.m. ● 4-speed gearbox ● Eaton 2-speed axle. ● Lockheed hydraulic brakes, servo assisted. Send for free literature.

Distributors for AUSTIN OF ENGLAND

Auckland: Seabrook Fowlds Ltd. Hawke's Bay: Anderson and Hansen Ltd. Wellington: Magnus Motors Ltd. Taranaki: The Farmers' Co-op. Organ. Society of N.Z. Ltd. Canterbury & Westland: David Crozier Ltd. Otago: Austin Motors (Otago) Ltd. Southland: P. H. Vickery Ltd.

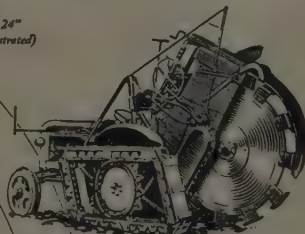


power driven blades turn your land to better account!

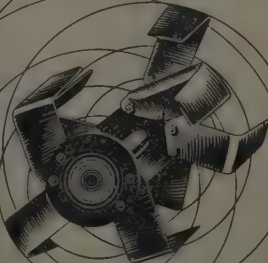
Rotavator Bantam plus
Mower, Cutter bar,
Hedge Clipper, Sprayer etc.



Rotavator Gem with
6 or 9 h.p. Motor
Rotor widths 20", 24"
and 30" (30" illustrated)



Rotavator Trench Digger
and Pipe Layer.



Rotavator Tractor Attachments.
Also 5' and 6' Trailing Rotavators.



Platypus 30 Diesel Crawler
with Rotavator attached.

ROTAVATORS LTD.

REPRESENTING THE WORLD'S LARGEST
MANUFACTURERS OF ROTARY TILLAGE EQUIPMENT

place for 4 to 6 weeks. This period appears to ripen the wood and gives better results than if cuttings are planted immediately.

Preparation of Cuttings

Cuttings should be made from 6in. to 7in. long and with a sharp cutting tool to avoid bruising the wood. Bruising is probably a major factor in the poor take on many nursery beds.

For small numbers of cuttings a sharp knife is the best tool to use. Secateurs, though often used, cause a certain amount of bruising.

For large numbers of cuttings a circular saw is satisfactory. The saw blade should be about 10in. in diameter, be kept well sharpened, and have little or no set on the blade. Canes may be put through in bundles of about 10. This method is quick and efficient and gives a very clean cut with no bruising.

The position of the cut does not appear to be critical, and it may be made in any portion of the cane, provided each cutting has several buds.

Planting out

Cuttings should be planted during July for best results. Earlier planting should be avoided, as the cuttings have to stand in the ground for the worst of the wet and cold winter weather; also there is a danger of too early breaking into growth and damage by frost. Frost will damage young, soft shoots, and if this happens, the plant is not vigorous enough to start into growth again and almost invariably dies.

Cuttings should be planted in rows about 3ft. apart to allow inter-row cultivation by machinery and the cuttings should be about 2in. apart in the row. This planting distance will allow between 80,000 and 90,000 plants per acre.

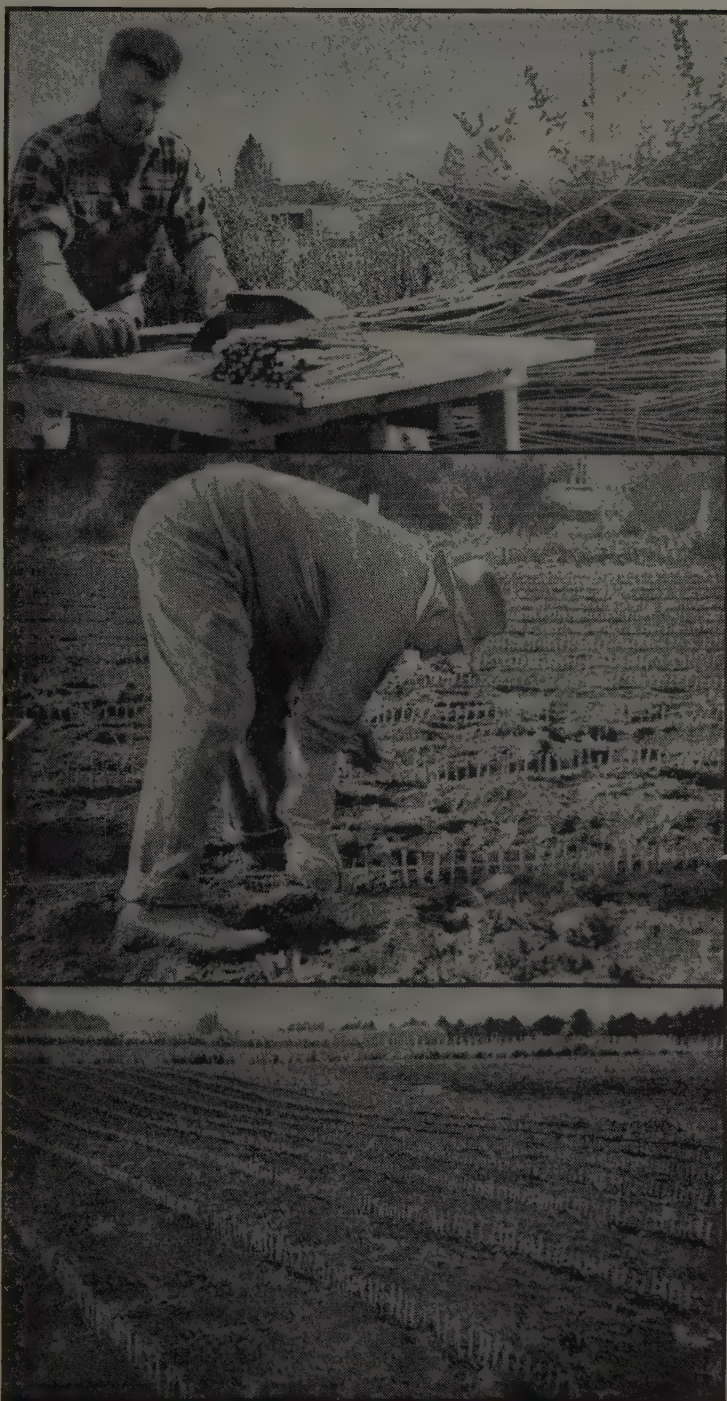
Straight lines are an advantage in later cultivation, and planting is best done using a line and planting on one side of it.

The best method is to start with a bundle of cuttings and work down the row, each cutting being pushed in vertically and very firmly to a depth of about 3in. On the way back for more cuttings, or at the end of the row, the planter can firm the planted cuttings by tramping down each side of them to exclude any air space round the bases.

Care must be taken after this not to touch or knock the cuttings until they have made roots.

Though gloves will be needed to handle barberry at almost all stages during planting, extra padding in the form of a bandage round the hand, either on the inside or outside of the glove, will be necessary. Even a thick leather glove will give insufficient protection for the palm of the hand when large numbers of cuttings are being planted.

Though other rooting mediums, such as sand, and rooting hormones have been tried, no better results have been



Upper—Canes being sawn by circular saw into suitable lengths for cuttings. Middle—Planting the cuttings out in rows. Lower—Cuttings lined out in a nursery.



Left—A double-furrow plough modified for wrenching by the removal of mouldboards and furrow wheel. Right—Plants being wrenched by the plough.

achieved than by use of the methods described.

Care after Planting

The first cultivation is usually necessary about 6 weeks after planting. This should consist of inter-row cultivation and hand weeding round the plants. No further hand weeding should be necessary, but cultivation will be required at about 3-weekly intervals until the plants are established and smothering any weed growth.

Cultivation should generally be done only when necessary, and care must be exercised to avoid knocking or loosening the soil round the base of the cutting. Any damage done to the

young plants during cultivation will usually result in the death of the plant.

Most seedless barberry is grown in areas of high summer rainfall, but where a drought or prolonged dry spell is experienced irrigation would be an advantage and improve plant growth.

Cutting back or heading plants during summer is not usually practised by nurserymen, but where plants are to be carried on for a further year or bushy young plants are required their top growth may be cut back by about two-thirds. This pruning also encourages stooling or shooting from below ground.

Digging and Packing Plants

Because of the bushy, fibrous nature of the root system of seedless barberry some form of wrenching is necessary. This is best done after growth has ceased in autumn. Wrenching may be done by hand or with a wrenching machine.

One method of wrenching is with a double-furrow, hydraulically operated plough with the mouldboards and furrow wheel removed. The cutting is done by the plough shares. From the rear the left share cuts down from the left and underneath the row of plants and the right share cuts down the right side of the row, thus completing the wrenching. After wrenching, the plants may be lifted by hand as desired.

Plants when lifted should be shaken free of soil and tied in bundles of convenient size, usually 100 plants to the bundle, and heeled in until required for planting on the farm or dispatch from the nursery.

It is an advantage to put straw round the roots and bag them, especially when they are to travel long distances. However, the plants are fairly hardy and will stand a fair amount of rough handling. Before the plants are dispatched the roots should be hosed down or dipped in water.

Any plants left over or discarded because of small size should be cut back hard and lined out in the nursery to be grown on for the next year.

Pests and Diseases

Barberry is a very hardy plant and has no significant enemies or diseases in New Zealand, though in some overseas countries it is known as a host plant for one of the wheat rusts and is avoided in wheat growing areas for this reason.

Meteorological Records for March

Station	Height of station above M.S.L. (ft.)	Air temperatures in degrees (Fahrenheit)				Rainfall in inches						Bright sunshine hours
		Approx. mean	Difference from normal	Absolute maximum and minimum		Total fall	No of days of rain	Difference from normal	Maximum fall			
				Maximum	Minimum				Amount	Date		
Kerikeri	201	67.1	+ 3.3	81.9	49.0	12.69	16	+ 8.51	6.05	14	128.3	
Auckland	160	68.0	+ 3.1	81.1	54.7	5.27	12	+ 2.12	2.86	14	154.9	
Tauranga	19	66.4	+ 3.8	84.4	45.1	5.02	5	+ 0.92	3.51	14	180.4	
Ruakura	131	65.6	+ 4.4	83.3	44.1	1.89	8	+ 1.09	1.28	14	161.2	
Rotorua	975	64.0	+ 3.5	85.6	41.0	2.13	14	+ 1.74	1.70	14	182.1	
Gisborne	12	63.4	+ 1.4	84.6	45.0	4.31	11	+ 0.61	2.00	11	186.5	
New Plymouth ..	160	64.0	+ 3.0	78.5	48.5	1.50	9	+ 2.24	0.57	30	180.9	
Karori	2125	58.4	+ 3.3	80.5	35.0	0.58	8	+ 1.76	0.22	17		
Napier	5	64.0	+ 1.6	80.0	42.8	6.03	9	+ 3.45	4.42	11	198.7	
Wanganui	72	64.3	+ 2.7	79.8	42.7	1.56	8	+ 0.59	0.35	11	181.6	
Palmerston North	110	62.8	+ 2.5	85.0	39.7	1.37	15	+ 0.86	0.36	17	140.5	
Waingawa	340	61.0	+ 2.0	84.0	35.0	2.21	10	+ 0.01	1.17	11	203.3	
Wellington	415	60.6	+ 1.2	77.3	43.8	2.84	9	+ 0.34	1.83	14	172.0	
Nelson airfield ..	5	61.4	+ 3.0	79.9	42.7	5.21	6	+ 2.52	3.67	14	205.8	
Blenheim	12	61.5	+ 1.6	84.5	38.2	3.06	5	+ 1.53	2.49	14	203.5	
Hokitika	15	58.8	+ 2.5	72.0	41.2	5.92	15	+ 3.52	1.97	13	146.3	
Hanmer	1279	56.8	+ 0.6	84.0	32.0	1.28	12	+ 2.08	0.43	17	180.3	
Christchurch ..	22	59.7	+ 1.6	84.3	37.3	0.33	6	+ 1.61	0.09	15	164.1	
Ashburton	323	59.2	+ 1.4	84.2	36.8	1.64	8	+ 0.56	0.35	10	142.1	
Timaru	56	57.7	+ 0.3	80.2	38.8	1.43	8	+ 0.70	0.47	14	152.1	
Alexandra	529	58.6	+ 1.9	87.2	36.4	1.19	9	+ 0.03	0.43	13	194.5	
Talior	80	55.4	+ 0.2	83.5	34.8	1.98	11	+ 0.09	0.75	8	136.2	
Invercargill airfield	0	53.6	+ 0.2	77.0	32.3	2.26	19	+ 1.77	0.45	17	158.4	



The Home Garden in June

THERE is always work to be done in a garden and though in most districts there is less sunshine and conditions are colder and damper in June than in any other month, garden work should not be neglected. In this article A. G. Kennelly, Horticultural Instructor, Department of Agriculture, Dunedin, discusses work in the vegetable garden in June.

GARDEN work in June usually consists largely of such work as planning for the forthcoming season, tidying and clearing away rubbish, digging over recently cropped ground, applying lime, improving paths, edges, and drainage, rebuilding or establishing garden features and cleaning and repairing garden tools, and where necessary spraying against pests and diseases. Sowing, planting, and maintenance of standing crops are reduced to a minimum.

Garden Tools

In wet weather garden tools should be sharpened and oiled or polished, and where necessary repaired. It may be thought by the less interested gardener that polishing garden tools is carrying enthusiasm for doing the job too far, but that is not so. A short time spent in removing rust and other residue that commonly adheres to garden tools and giving the working parts a smooth finish will be more than compensated for by the time and energy saved when they are used.

Soil or rust adhering to garden tools may make work more than twice as difficult. It makes for inefficient garden practice and an uncraftsman-like finish to work. Soil adheres less

readily to smooth, polished surfaces, and when it does it is more readily removed.

All cutting edges should be very sharp unless the tools are to be used by children or those who cannot handle them competently, in which case the cutting edges of tools such as hoes, spades, and shovels are better not fined down to the extent that they may be dangerous if incompetently handled. The intelligent use of tools suited to the job is one of the most obvious though less practised forms of labour saving in the garden.

It is not always realised that heavy soils, particularly if they are inclined to be wet, can be dug with much less effort if a fork with clean, sharp tines is used instead of a spade. Not every home gardener has a long-handled shovel, but a good one with a sharp, clean blade makes much garden work easier. Though use of a shovel in digging has sometimes been regarded critically by some of the older and more highly orthodox gardeners, soil can be dug with it effectively and with less effort than with a spade or fork, because its long handle gives greater leverage and eases the strain on the back by reducing the amount of stooping needed. At least some of the

prejudice against the use of the long-handled shovel for digging instead of the spade seems to have originated with gardeners who gained their early experience of gardening in Britain, where in many parts and until recently at least the long-handled shovel was little known.

Cultivation

For surface cultivation the use of the best types of hoe is very important. In particular the push hoe should have a wide, sharp, clean blade set at such an angle that when the handle is held at a convenient height in working the blade can be pushed along in the soil to cut weeds a little below the collar or junction of the root and stem.

The blade of the chop hoe should be solid and sharp, but not too wide, because then the work will be laborious if the soil is heavy or weeds well established.

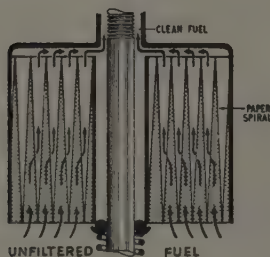
Rakes are not much used in soil preparation by most experienced gardeners, but a rake should be well balanced and have teeth of adequate length. They need not be sharp for soil preparation.

Deep Cultivation

It is only a few years since the advocates of the "surface cultivation only" school of thought received a great deal of publicity, and such methods may have merit on certain soils and under certain conditions. Some form of deep cultivation is necessary, however, in most gardens, where the ground is chiefly occupied

Heading photograph by R. W. Orr.

Amazing!



a PAPER filter for oil fuel

Scientific tests have proved conclusively that the new C.A.V. Paper Element filter is by far the most effective device yet produced for ridding diesel oil of damaging dust particles.

This means that C.A.V. Fuel Injection Equipment will give you even longer trouble-free life, and prolonged economy of fuel consumption, with maximum power.

For certain C.A.V. Fuel Injection models, not already fitted with the new Paper Element Filter, inexpensive conversion sets are available. It will pay you handsomely to look into the matter.

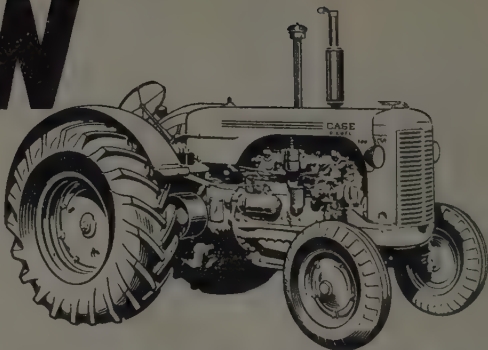
Consult your nearest
Service Agent for



FUEL INJECTION EQUIPMENT

	Phone
Whangarei Engineering Co., Whangarei	2639
Joseph Lucas (N.Z.) Ltd., 75-77 Beach Road, Auckland 3	lines 34-330
Unity Buildings, Hamilton	40-840
Grey Street, Tauranga	1010
Commerce Street, Whakatane	124
L. M. Silver & Co. Ltd., 263 Victoria Avenue, Wanganui	2632
King Street, Palmerston North	5889
Jervols Quay, Wellington	54-555
Wooft & Salvesen Ltd., 17-19 Lichfield Street, Christchurch	87-403
A. M. Duncan, 34 Latter Street, Timaru	1594
Wooft & Salvesen (Dunedin) Ltd., 260 Cumberland Street, Dunedin	13-642
Ross Mitchell Ltd., Don. St., Invercargill	930

NEW 64 H.P. CASE DIESEL



... with POWER STEERING

Mighty 5-plough power . . . great capacity with easy handling . . . truly fine craftsmanship with long-lived durability. Big 6-cylinder engine starts on diesel fuel at the touch of a button. This new Case "500" brings new economy in diesel operation and upkeep. Power Steering and other driver conveniences mean more work done with less effort. Ask for full details.

DISTRIBUTORS —
NATIONAL MORTGAGE & AGENCY
CO. LTD., Dunedin, Oamaru, Timaru,
Waimate, Ashburton, Christchurch and
Hokitika.
J. G. WARD & CO. LTD., Invercargill
and Gore.
C. W. PARKER & CO., Blenheim.
NORTH ISLAND enquiries to Box 292,
Christchurch.



CASE

G.6806



Suitable for Workers'
Accommodation, Halls,
Stores, Offices, Baches,
Workshops, etc.

SIZES:

10ft. x 10ft., 10ft. x 20ft.,
10ft. x 30ft., etc., etc.
20ft. x 20ft., 20ft. x 30ft.,
20ft. x 40ft., etc., etc.

PREFABRICATED BUILDINGS

EASY TO ERECT YOURSELF!

INEXPENSIVE! ATTRACTIVE! NEW MATERIALS!
Curved Roof Prefabricated Buildings also available
WRITE TO:—

BARR-BROWNS LTD.

49 Gracefield Road - - - LOWER HUTT

BB3

with annual and biennial crops, to incorporate manures and green or vegetable crop residues, to improve aeration and drainage of heavy, fine-grained soils, and to destroy weeds and perhaps check pests.

Deep digging is not necessary on all garden soils. The chief factors to be considered are the character of the soil and the need for destroying perennial weeds and incorporating organic matter and fertiliser. Aeration and drainage of heavy, fine-grained soil is likely to be improved by digging, but there is not likely to be any such advantage in digging light soils unless the subsoil is heavy or sticky. If soil has what the farmer calls a "plough sole", a rather impervious or partly puddled layer just under the first spit, digging should improve drainage and aeration and consequently the growth of most crops.

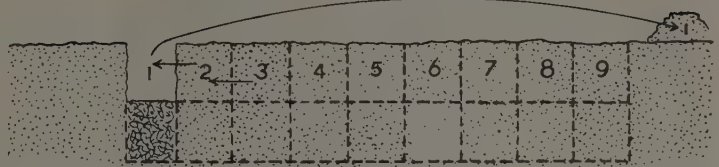
If the subsoil is to be dug or forked over, too much of it should not be brought to the top spit at once. It is usual to cultivate it by double digging, the method also known as mock trenching (see diagram above) or, if the subsoil requires breaking to a considerable depth, by trenching (see diagram below).

Loosening of soil is important in heavy, fine-grained soils that have become compacted, as it promotes aeration and improves drainage. Water requires about five times as much energy to heat as an equal weight of soil minerals, and well-drained soils thus warm more readily than water-logged soils.

Exposing Soil to Weathering

Home gardeners are usually advised to dig over recently cropped land to expose it to winter weather. Generally the advice to dig over such land is sound if it is soon to be planted or sown, but if there is a good coverage of crops or crop residues or weeds that are not maturing seed, digging is usually only necessary for tidiness and can be done later or in late winter or spring in time for the vegetation dug in to rot so that it will not interfere with the growth of crop plants subsequently grown. Autumn digging is sometimes useful in disturbing the winter shelter of insects and exposing them to the weather.

The physical benefit to the soil of exposing it to winter weather is not as apparent in New Zealand, where in most districts garden soil is almost never frozen in depth and at most is usually frozen for only comparatively brief periods, as it is in some countries overseas. Leaving the soil surface rough and uncropped during winter may lead more to soil erosion and loss of organic matter and leaching of plant nutrients than to the breaking up of hard lumps of soil. Even on sloping ground erosion is usually curbed and run-off retarded better where the land is covered by vegetation such as a green crop than when it is left uncropped and rough. Few well-worked home garden or market garden soils need the pulverising effects of frost, as they do not readily become lumpy as



Double digging or mock trenching. The second spit is forked over, but not removed.

soils used on a farm scale commonly do.

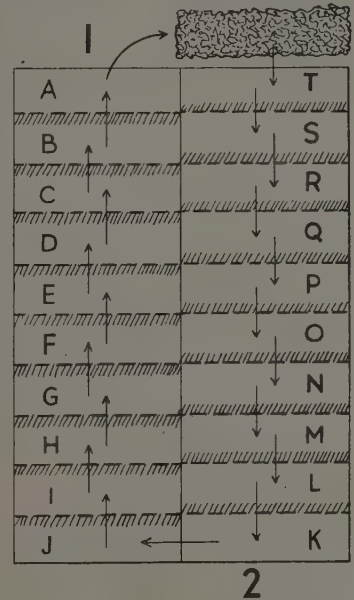
For the home gardener there are three principal methods (apart from surface cultivation such as hoeing) by which an area may be cultivated. It may simply be dug over or forked over one spit deep. This is satisfactory on well-drained soil or heavy soil that has been deeply dug during the past 2 years. It may be double dug, that is, cultivated to a depth of two spits, a practice also known as mock or bastard trenching. This system though not as effective as full trenching, is that most commonly practised and gives excellent results. Finally, there is full trenching, a laborious operation in which the ground is cultivated to a depth of three spits.

Clearing Soil Surface

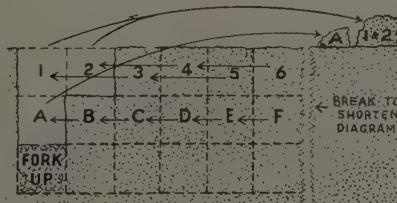
Where there are weeds or crop residues the loose material should be raked off and the surface soil skimmed $\frac{1}{2}$ in. to about $\frac{1}{4}$ in. deep for a foot or two back from the line of digging so that above-ground parts of weeds and crop plants are cut off just below the collar. Residues should be put back to 3 on the upper and lower diagrams on this page and placed in the trench as soon as it is excavated. In trenching, soil is then excavated from 1, 2, and A (lower diagram on this page), the surface soil and subsoil being heaped separately where it is intended to finish. The bottom or third spit is then forked over and B is thrown into A; 3 is then dug over into 1 and C moved into B; 4 is moved to 2 and the whole process is then repeated by moving D to C, skimming surface rubbish, and moving 5 to 3 and 6 to 4. The method by which the work is completed is shown at right in the lower diagram on this page.

Narrow plots are usually dug over the full width, the soil from the first trench being deposited at the finishing point. Plots that are sufficiently wide are more easily handled if divided as shown in the middle diagram. If the

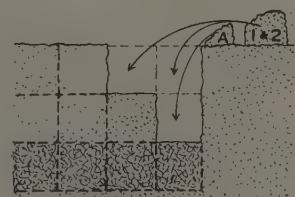
land is covered by vegetation, the growth is best skimmed off with the top $\frac{1}{2}$ in. to about $\frac{1}{4}$ in. of soil and placed at B and C. Soil is then dug out one spit deep from A and heaped parallel with T as shown. If necessary, rubbish should then be skimmed from B and perhaps C and placed in the trench.



Then the worker while facing 1 excavates B, filling A with the soil. Continuing he skims C if it is necessary and puts the residue into B; he then excavates C into B and so on until J is dug out. The process is repeated with the worker facing 2 until T is excavated. Finally T is filled with the soil from A. If the ground is being double dug, the trench must be wide enough to permit the subsoil to be forked up.



Proper method of trenching three spits deep. Left—The soil is dug so that each layer remains at its respective level. Right—The way to finish.



Left—The soil is dug so that each layer remains at its respective level. Right—The way to finish.

SPEEDWAY

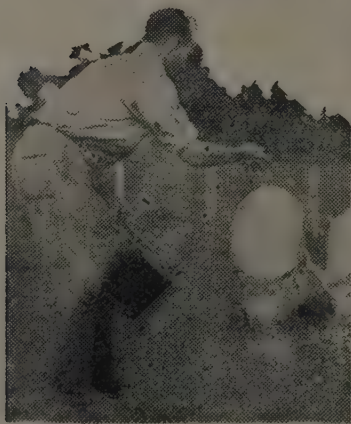


LOW & HIGH PRESSURE OIL BURNING BOILERS

Write for FREE Illustrated Catalogue
SPEEDWAY PRODUCTS LTD.
26 ALBERT ST., AUCKLAND, P.O. Box 159

Branches at
Ford Bldg. Courtenay Place, Wellington
156 Manchester Street Christchurch

TOMOANA PIG PELLETS NOW WITH SOYA BEAN MEAL



Tomoana Pig Pellets are easy to feed out. Trained from pig ground in a different position each day, pugging is prevented and every sow gets her fair share. Tomoana Pig Pellets are specially compounded so that every particle of food intake is assimilable to the utmost—it is packed straight into the litter. Tomoana Pig Pellets contain specially concentrated forms of nourishment and supply the sow's urgent need for both B-complex vitamins, and the fat-soluble Vitamins A and D.

Order From Your Merchant. G.6980

ATOS

ALLEN
TRACTOR
OPERATED
SHOVEL

IMPROVED MKIII

MODEL The ideal machine for Builders, Contractors, Farmers, Local Authorities, Gas, Water & Electricity Undertakings.



Entirely Hydraulically Controlled

This highly mobile tractor attachment has been designed to overcome the problem of expensive hand labour on building sites, farm drainage, and similar excavation jobs. The operation of ATOS is extremely simple as there are only 3 controls—ALL HYDRAULIC . . . no brakes, clutches or gears to give trouble. Easily converted from a shovel to a trench digger in a few minutes by simply changing the bucket.

New Zealand Distributors:

THE DOMINION MOTORS LIMITED

Head Office, Courtenay Place, Wellington, and at Auckland, Christchurch and Timaru.
Authorised dealers throughout New Zealand.

Gluttons for dust!

No home is complete without an electric cleaner and your final choice as to whether you will have an external bag or a cylinder model is really only a matter of personal choice. Both models are highly efficient, speedy and reliable.

EXTERNAL BAG MODEL • Easily cleaned, highly polished carriage. • Blue dustbag of dust-proof hard-wearing material. • Powerful motor. • Carpet nozzle adjusts itself to suit varying thickness of pile. Shaped for powerful suction.

CYLINDER MODEL • Grey and maroon finish. Easily cleaned. • Lightweight. • Manoeuvrable. • Foot starter-button.



£16/10/-
Complete
with
attachments

S.E.C.

MADE IN ENGLAND

SUCTION CLEANERS

at your nearest Electrical Dealer or—

BRITISH GENERAL ELECTRIC COMPANY LIMITED

Wellington, Auckland, Christchurch, Dunedin

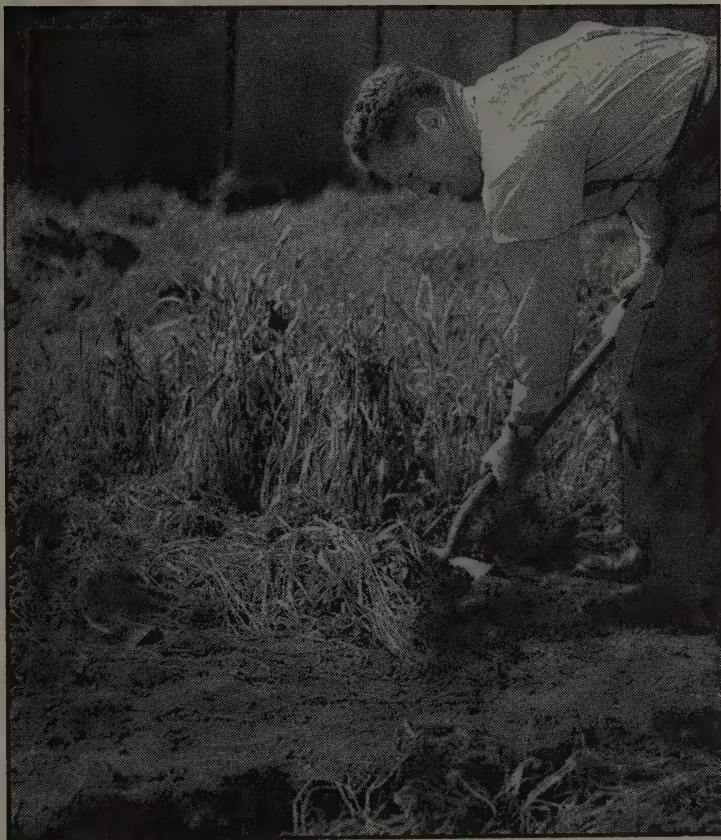
SC-1-9

Potatoes should be sorted over from time to time to pick out any which are going rotten. In districts where specially early potatoes can be grown, tubers of a suitable variety should now be placed on a floor or in boxes in a light, airy, frost-proof shed or outhouse to enable the skins to become green and to allow short, strong shoots, which are important for early production, to develop.

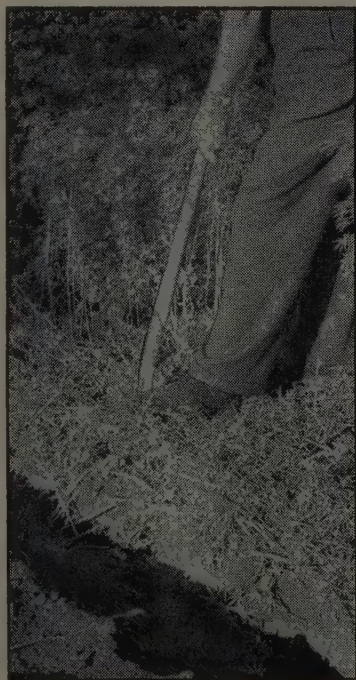
Where the tuber moth is troublesome seed tubers, particularly the eyes or any scars or clearly marked depressions on them, should be dusted with D.D.T., arsenate of lead powder, or hydrated lime. Potatoes stored in sheds or outbuildings in districts subject to heavy frost should be protected from excessively low temperatures. If the building is open or if there are cracks in the walls, so that air at freezing temperatures can enter and freeze the tubers, the yield from them may be significantly reduced.

Pumpkins and marrows: More than a few degrees of frost will spoil pumpkins and marrows for long keeping. If they are not injured and do not come in contact with decaying matter, they keep well in any dry, airy, frost-free place. Spraying fruits with Bordeaux or copper oxychloride or dipping them in solutions of these will help to prevent decay through storage rots.

Root crops: In most districts root crops such as carrots, parsnips, beet-



[Green and Hahn
Deep digging of light to medium soils where the subsoil is well drained is not necessarily advantageous, but some form of digging is necessary even on light home garden soils for such purposes as incorporating organic material, placing fertilising matter throughout the root area, and reducing weed competition with crop plants. One of the first steps where vegetation is so heavy that it cannot be conveniently turned in is to skim it off.



[Sparrow
Digging a green crop under,

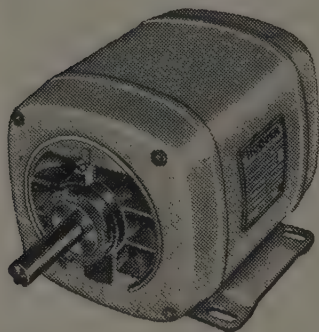
root, swedes, and turnips are best left in the ground to be dug as required; in fact, frost improves the flavour of parsnips and swedes. However, if limitations of space or unfavourable winter soil conditions enforce the digging of any of these vegetables, they are best pitted, which may be done in a number of ways. Probably the commonest method is to cover a heap of roots with a layer of straw and then 2in. to 3in. of soil, a small area of straw being left uncovered at the top of the heap for ventilation; a piece of tin over this vent will keep out the rain. A method suitable for small quantities is to bury the roots or plunge them in a layer of clean sand or fine coal ash in a shed or cellar. Before carrots, parsnips, or swedes are stored the tops should be cut off close to the roots, but on beetroot it is better to leave from $\frac{1}{2}$ in. to 1in. of tops to avoid bleeding.

Tomatoes: Except in a few specially favoured districts all outdoor tomatoes should have been harvested and the plants dug out and burnt. Recently harvested fruit which is mature but not yet coloured is best ripened by being packed in a case or box and placed in a warm room or shed. The widespread practice of exposing such fruit to the sun on window ledges or similar places often results in a high proportion of shrivelled or collapsed fruit. Only sound, reasonably mature fruit should be packed, as fungous growths develop and spread quickly from injured fruit in storage.

Sowing and Planting

Unless conditions are especially favourable, sowing and planting must proceed only with extreme caution. In most areas growth at this time of year is so slow that there is a considerable

HOOVER F.H.P. Motor



SINGLE PHASE

split phase or capacitor
start (50 cycles)

230 VOLT

1/6-1/2 H.P. (1/2 H.P. Cap. Start)	2 pole (2850 r.p.m.)
1/6-1/2 H.P.	4 pole (1425 r.p.m.)
1/6-1/2 H.P.	6 pole (950 r.p.m.)

THREE PHASE

50 cycles

400 VOLT

1/6-1/2 H.P.	2 pole (2850 r.p.m.)
1/6-1/2 H.P.	4 pole (1425 r.p.m.)
1/6-1/2 H.P.	6 pole (950 r.p.m.)

Hoover Motors are made
to British Standard

Specifications 170/1939

12 MONTHS' GUARANTEE.
AVAILABLE EVERYWHERE

CONTAGIOUS FOOT-ROT IN SHEEP

Use Chloromycetin Veterinary
Solution 10% for the eradica-
tion of this serious disease.

"PINK-EYE" IN CATTLE

Also known as "Eyebright",
Ophthalmia will spread rapidly
if unchecked. Isolate and treat
affected stock with Chloromyce-
tin Veterinary Eye Ointment.
In early cases one application
will effect a cure.

Obtainable from all distributors
of Parke-Davis products.

PARKE, DAVIS & CO., Ltd.
BOX 4198 — SYDNEY

MOLACTRATE

PROTEINISED MOLASSES

BLOCK

**Just put it out in
the paddock . . .**
Your Stock do the rest!



DISTRIBUTED THROUGHOUT N.Z.



BY BARGOOD SON & EWEN LTD

risk that before growth is properly started seed or young plants will fall victim to the many insects and parasitic fungi which inhabit the garden.

Broad beans: Though it is rather late, a sowing of broad beans made now will provide a welcome addition to the limited range of vegetables available in early summer. They should be sown 2in. to 3in. deep in a double row with the beans zig-zagged 4in. apart in rows 3ft. apart. A quart of beans will sow 100ft. of row. The broad bean is a hardy vegetable and will withstand quite severe weather.

Cauliflower, cabbage, and lettuce: In districts which have a mild winter, spring cauliflower such as the All Seasons variety, early round-head cabbage such as Golden Acre, and lettuce such as Neapolitan Winter and Imperial 615 may be sown or planted. Elsewhere it is better to delay sowing or planting or sow in a frame or in a warm sheltered situation. Plants from these sowings will be ready for setting out early in spring.

Spinach, peas, radish, and spring onions: If the ground is well drained and the soil not too heavy and wet, sowings of spinach, radish, and spring onions may still be made. Peas of an early dwarf variety such as William Massey sown during the early part of June will add variety to spring menus, but these crops should not be sown unless soil conditions are favourable; if there is doubt, it is better to wait until July or August.

Established Crops

Standing crops such as broccoli or winter cauliflower, savoy cabbage, and

Below—Broccoli or winter cauliflower are among the most useful vegetables for late autumn, winter, and spring use.
Green and Hahn photo.



[Green and Hahn

A few leeks left now when there are other vegetables available may be very useful in a later period of scarcity.

the earlier planted spring cabbage should be kept weed free. Spring cabbage or cauliflower which are making insufficient growth usually benefit

from organic liquid manure or either sulphate of ammonia or nitrate of soda at about 1oz. to 4 gallons of water.

Asparagus: The fronds of asparagus will now have lost their green colour and should be cut down. They can be cut to within a couple of inches of the ground and removed before manure is applied.

If it is intended to plant a new bed, it is advisable to make a start in June. Asparagus beds last for many years and time and effort expended in their proper preparation will be amply repaid. The bed can be 3ft. 6in. to 4ft. wide and the ground should be deeply trenched, perennial weeds removed, and, if necessary, the site drained. Organic manure should then be incorporated in the soil.

Broccoli should be watched for signs of approaching maturity. Apart from their hardiness and the longer period required for them to mature, the principal difference between this class of cauliflower and the summer cauliflower is that the broccoli is partially or wholly self-protecting. The outer leaves are sufficiently stout and long to curve over and so protect the curd from frost and, to some extent, rain and light. Winter cauliflower must therefore be watched as the curd develops to ensure that the outer



Rhubarb root split up for planting.

[Green and Hahn

leaves are giving the necessary protection. Should the curd be exposed, an inner leaf or two bent over or broken to cover it will give effective protection.

Leeks: The leek is among the most easily grown of vegetables, as it is little troubled by either insect pests or diseases; most crops should now be reaching full growth. Leeks "stand" well, and if the supply of winter greens is likely to become exhausted before the spring greens are ready, a few leeks left now may be useful later.

Rhubarb: The rhubarb bed should be weeded, forked over, and manured. Rhubarb is a gross feeder and responds well to liberal dressings of organic manure. June is one of the best months to replant or extend a rhubarb bed. The roots should be dug with a strong, sharp spade and placed in a shady site where they are not exposed to drying winds. They may be left until the development or shooting of the buds indicates planting time. Each good bud together with a good piece of root adhering to it cut from the clump should develop into a plant if set out. Preparation of the site of the intended bed may be started, and if it is now dug over, cleaned of weeds, manured, and if necessary drained, it will be ready for planting time.

Device to Stop Lambs from Drowning in Drinking Troughs

ON dairy farms that have gone over to sheep it is often necessary to construct ramps up to water troughs so that sheep and lambs may have access to water. These can be dangerous and may cause drownings, especially of lambs when they are drinking or playing around the troughs, which are often 18 in. to 2 ft. deep.



Mr. E. Bond, of Taupiri, who has recently changed from dairying to fat lamb breeding, has constructed a practical and cheap form of netting cover to avoid these losses. Over a frame of light timber is stretched $\frac{1}{4}$ in. mesh wire netting laced to No. 8 wire twitched around the trough. At the drinking side the netting is dished under the water sufficiently to allow easy access for both sheep and cattle.

—H. McM. BULL,
Instructor in Agriculture,
Department of Agriculture,
Hamilton

Onion Growing Trials on Rukuhia Peat

By I. L. ELLIOTT, Assistant Superintendent,
Department of Agriculture Rukuhia Soil
Research Station

WHEREVER peat soils are being developed for cropping onions seem to be a favourite crop. The same trend can be seen in New Zealand, where over half the total crop is grown at Marshland, near Christchurch, and Opiki, in the Manawatu, both of which are areas of peat or peat mixed with other soil types. Onions appear to thrive well in these soils, probably because of the ease with which they can push out their roots in search of plant foods and moisture.

IN experimental work at Rukuhia Soil Research Station on the Rukuhia peat soils it has been the policy to investigate the possibilities of growing a number of different crops, even though they are not at present commonly grown in the district. The principal objective of this work is to discover a range of cash crops which could be satisfactorily grown on peat and to compare their conditions of growth and yield with those obtaining on normal mineral soils.

During the 1953 season particular attention was focused on the onion crop, and this was grown under a range of differing water-table conditions and fertiliser treatments, particularly as far as nitrogen was concerned.



Part of an onion trial on Rukuhia peat, showing the excellent growth obtained.

Generally trials have shown quite clearly that under local conditions a water-table 2ft. from the surface gave best results. In other words, peat

soils require to be well drained and well decomposed before an attempt is made to grow onions. It is, however, equally true that onions need adequate moisture up to the stage of bulbing, and in very dry years a higher water-table than that mentioned may be desirable.

Field observations together with yield data suggest that there is likely to be a much greater response to nitrogen under conditions of high water-table than where the soil is well drained. This is quite a well-known phenomenon and finds practical application in the field wherever an attempt is made to grow onions with inadequate drainage, such as is often encountered in the earlier stages of the development of raw peat soils or during particularly wet peat seasons. Under these conditions it will pay handsomely to use extra nitrogen, and applications of up to 10cwt. per acre of dried blood or its equivalent are suggested.

Provided careful attention is paid to the fundamental principles of development, most of which were fully discussed in the article "Vegetable Growing on Peat", which appeared in the April 1953 issue of the "Journal", there is no doubt that onions are among the most important crops for consideration when peat areas are brought in for cropping. At present the average yield for the Dominion is about 9 tons per acre. Plots well treated and adequately drained yielded in these experiments about $1\frac{1}{2}$ times the New Zealand average.



A selection of onions typical of those grown in the trials described here.

ELASTRATOR

Rubber Rings

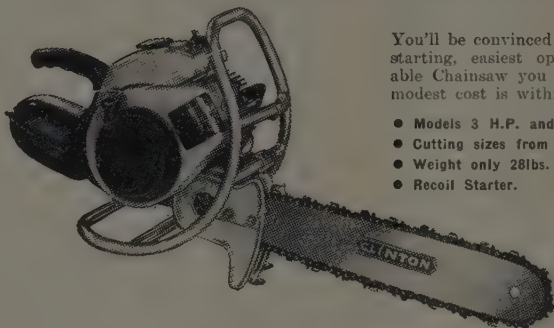
Ready now for
next season's
**LAMB & CALF
CASTRATING**

**UNSURPASSED
for
positive results!**

Rubber Rings . . .
the complete answer
for castration.

The Elastrator Co. Ltd.
P.O. Box 226, Blenheim

CLINTON CHAINSAW



You'll be convinced here's the quickest starting, easiest operating, most reliable Chainsaw you can buy. Clinton's modest cost is within reach of anyone.

- Models 3 H.P. and 5 H.P.
- Cutting sizes from 14" to 42".
- Weight only 28lbs.
- Recoil Starter.

CLINTON CHAINSAW DEALERS:

NORTHLAND: N.Z. Loan & Mercantile Agency Co. Ltd. AUCKLAND: Farmers' Trading Co. Ltd., Broadway Motors Ltd. PAPAURA: O'Shannessey & Chadwick Ltd. THAMES: Dalgety & Co. MATAMATA: Matamata Machinery Exchange. ROTORUA: G. E. Giltrap. WHAKATANE: Cutler Bros. TE KUITI: N.Z. Loan & Mercantile Agency Co. Ltd. TAUMARUNUI: Mananui Motors. PALMERSTON NORTH: Field Machinery Ltd. WANGANUI: Wright, Stephenson & Co. Ltd. TAURANGA: N.Z. Loan & Mercantile Agency Co. Ltd. OTOROHANGA: G. G. Sanders Ltd.

N.Z. Factory Representatives:

AGRICULTURAL CULTIVATORS (N.Z.) LTD., P.O. Box 1102, Auckland

3/5

Riding and Tractor COATS

These coats are made in Galon material, which is produced in Sweden. This type of coat has been tested throughout the world, and has proved highly successful. The material is resistant to acids, alkalies and stains. It is plasticised to make it waterproof, and the fabric backing is very strong, so that it will withstand the hardest wear.

Sole N.Z. Manufacturer

K.D.V. BOXES LTD.

P.O. BOX 8572
UPPER SYMONDS STREET,
AUCKLAND

All enquiries welcomed.



The garments we manufacture are available in Riding and Tractor Coats, Trousers, Leggings and Helmets, and can be obtained at all leading STOCK & STATION AGENTS, FARMERS' SUPPLIES, ETC.

Drain Cleaning Attachment for a Tractor

By D. F. SCOTT, Machinery Instructor,
Department of Agriculture, Auckland

A NEW drain cleaning attachment for hydraulically equipped wheel tractors was demonstrated recently near Pokeno. At first glance the machine looks similar to the conventional rear-mounted grader blade, but closer inspection reveals several important differences which give the machine its considerable advantages over the grader blade in cleaning and to a less extent in digging open drains.

THE machine consists of a blade which is permanently fixed at right angles to the central axis of the tractor and is attached to the tractor's hydraulic lift arms. Two extra double-acting hydraulic rams are fitted, one to give the blade a positive downward pressure and the second to control the angle of the blade in the vertical plane.

The machine was mounted on a normal medium to large rubber-tyred wheel tractor and though no extra grippers were fitted and the demonstration took place under extremely muddy conditions, the tractor showed no signs of wheel slip. The machine was used to clean an open drain at the edge of a very wet paddock. The drain was approximately 3ft. 6in. deep and 4ft. across the top, and the machine worked at approximately 3 chains per hour. If necessary, it can work on drains as deep as 6ft. and where a drain has a bank of old spoil along the side the cleaner can be used first to pull this bank and spread it and then to clean the drain.

In operating the tractor the driver backs it so that the blade is suspended over the far side of the drain. The blade is lowered and forced downward by one of the extra hydraulic rams to cut the far bank on a slight slope. The tractor is driven forward slightly and the blade angle control operated so that as the tractor drives forward the blade rides up the near bank of the drain carrying the spoil and cutting the bank on a gentle slope. Any degree of slope desired for this bank can easily be attained by making extra cuts with the machine. The machine drives forward carrying the spoil sufficiently far from the drain; then it backs into a new position and repeats the performance. On deep or badly blocked drains several runs are made in the same place.

Though it is emphasised that the machine was designed as a drain cleaner, users have found that it can be satisfactorily used to dig drains. In digging a drain 4ft. wide at the top, 3ft. 6in. deep, and 1ft. wide at the bottom the machine progressed at more than 1 chain per hour.

Illustrations at right: The drain cleaning attachment the operation of which is described above.



Care of Livestock during June

Contributed by the Animal Research Division



A dairy herd being fed supplementary hay in winter.

SOWS and store pigs should be fed on roots, grass, and up to 1lb. of meat meal or other high-protein feed daily. Grazing pigs should not be confined to small paddocks during winter. The use of large grazing areas will reduce pasture damage considerably. Warm accommodation is essential for winter store pigs in order to avoid losses and maintain steady growth. Early farrowing sows should be put in their farrowing quarters and fed 3lb. to 4lb. of meal daily. After farrowing they should be fed 4 gallons of skimmed milk plus 2/3 gallon for each piglet suckled. Where insufficient milk is available meal should be used to replace the milk in the ratio of 1lb. of meal to 1 gallon of milk. Constipation, which is common in late pregnancy, can be avoided by feeding 1/2 lb. of bran daily or 4oz. of molasses 2 or 3 times during the last 10 days before farrowing.

PIG PRODUCTION

In areas where sheep become infested with liver fluke flocks should be drenched now. The only effective drug is carbon tetrachloride, which should be mixed with 4 times its volume of liquid paraffin. The dose of the mixture is 5 c.c. for sheep of all ages, and 1 gallon is enough for about 900 sheep. Further information about liver fluke in sheep and cattle will be found in Bulletin No. 248, which is available from the nearest office of the Department of Agriculture.

LIVER FLUKE IN SHEEP

Worms are sometimes still troublesome in May and June, and if lambs or calves are not doing well, they should be drenched with phenothiazine at the full dosage rates recommended by the manufacturers. Further information about worms and drenching will be found in Bulletins Nos. 171 and 189, which are obtainable from the nearest office of the Department.

WORMS IN LAMBS AND CALVES

Poultry lice can cause considerable loss of condition in birds and reduced egg laying. To control these parasites a fine trickle of 40 per cent. nicotine sulphate should be run along the perches on a calm night before the birds go to roost. Two or three treatments should be given at weekly intervals.

LICE ON POULTRY

Experiments have shown that cows fed well during winter will produce from 26lb. to 63lb. more butterfat in the following lactation than those which have been poorly fed during winter. These results were obtained when both groups were well fed after calving. It is therefore very important to feed the cows well from now until calving so that they have ample body reserves to draw on during the first 2 months of the lactation. It is difficult to build up these body reserves with even liberal amounts of hay and/or silage unless some grass is also available throughout the dry period. With a portion of the farm closed up for autumn-saved pasture for feeding after calving it is particularly important to graze the rest of the farm under a controlled rotational grazing system with adequate spelling between grazings, both to ensure continued grass growth during winter and to ration what grass is available throughout this period. Where subdivision is inadequate for this purpose break grazing with the electric fence is essential. Since cows will eat grass in preference to most other feeds, they should be fed as much hay as they will clean up in addition to 20lb. of silage per cow per day.

WINTER FEEDING OF DAIRY COWS

Rickets in lambs occurs frequently during winter in Canterbury and other South Island districts. It is also occasionally seen in the North Island. Lambs wintered on green oats or barley are most susceptible, but other green feed or good pasture may produce the condition. It can be prevented by giving one dose of 25 m.g. of calciferol (a vitamin D concentrate) at the beginning of winter. This preparation can be purchased dissolved in olive oil and full instructions for its use are supplied with it. Even where rickets does not occur this treatment may induce better growth in lambs during winter. It is unlikely to be beneficial during autumn, and the best time to administer it is about the end of May.

RICKETS IN LAMBS

Dairy Produce Graded for Export

THE following figures showing quantities of dairy produce graded for export during March and for the 8 months ended 31 March 1955, with comparative figures for the same month and 8-monthly period of 1953-54, have been compiled by the Dairy Division of the Department of Agriculture from figures supplied by divisional officers at the various grading ports:—

Period	BUTTER			Percentage inc. or dec.
	Creamery (tons)	Whey (tons)	Total (tons)	
March 1955	11,484	297	11,781	—
March 1954	9,556	284	9,840	—
Increase or decrease ..	+1,828	+13	+1,841	+18.521
8 months ended 31/3/55	137,676	2,671	140,347	—
8 months ended 31/3/54	131,586	2,660	134,246	—
Increase or decrease ..	+6,090	+11	+6,101	+4.545
Butter in store at 31 March 1955 was 25,803 tons				

Period	CHEESE			Percentage inc. or dec.
	White (tons)	Coloured (tons)	Total (tons)	
March 1955	6,445	2,254	8,699	—
March 1954	5,584	25	5,609	—
Increase or decrease ..	+3,139	+2,229	+5,368	+94.79
8 months ended 31/3/55	69,523	18,040	87,563	—
8 months ended 31/3/54	85,563	159	85,724	—
Increase or decrease ..	—17,042	+17,881	—839	—0.979
Cheese in store at 31 March 1955 was 30,816 tons				

If these figures are converted into butterfat equivalent, there is an increase of 3.748 per cent. in butterfat graded for the 8 months as compared with the corresponding period of the preceding season. The above figures refer only to butter and cheese graded for export, and owing to diversions which may take place from time to time they are not necessarily a true indication of production trends.

Winter Pasture Management and Supplementary Feeding

Seasonal Notes by the Extension Division

FIELDS on dairy farms for autumn-saved grass for late winter and early spring feeding should be closed from late April to the middle of June. If growing conditions are good and early closed fields become rank, they should be quickly and lightly grazed and then closed again. Autumn-saved grass gives milking a good start, but a break in feeding should be avoided by having other fields ready for grazing when the autumn-saved grass is finished. The best way to achieve this is to rotate dry stock through winter round the rest of the farm, feeding out hay and silage in each field in turn, and then harrowing and closing for feeding in rotation after the autumn-saved grass is finished.

NORTH ISLAND FAT LAMB FARMS

ON fat lamb farms it is important that there should be an ample supply of good-quality feed for use just before and after lambing. Pasture is best, but unfortunately growth is usually backward at that time. By controlled grazing in late autumn and early winter, however, valuable feed can be conserved for this critical period. Trials have shown that ewes can be kept on a level of feeding just sufficient to maintain body weight from mating until a few weeks before lambing without harmful effects to either the ewe or the lamb. This means that the flock can be done fairly hard from April until mid-June and so allows paddocks to be shut up for pre- and post-lambing feed. Pasture growth usually shows a considerable improvement in April and May as a result of the autumn rains and the quantity of feed available is usually greater than that necessary to meet requirements. As large a proportion of this surplus as possible should be conserved for later use and in seasons when the surplus is not great it may even be good policy to keep the ewes on a maintenance level of feeding until the end of June to conserve feed for a more vital later stage. Such conserved pasture may need light grazing during winter to prevent its becoming too rank, but it can be held to provide valuable greenfeed before good growth commences in spring. After mating ewes in poor condition should be separated from the main flock and given more generous treatment, but the remainder should be put on a maintenance diet. Where the flock is a large one it should be divided into two mobs, but whether this is done or not the objective should be the same; to close as many paddocks as possible and maintain the ewes on the remainder. Pastures which have been allowed to get out of control earlier in the season can be cleaned up at this time and should be grazed hard. The ewes should be rotated around the paddocks until a few weeks before lambing. This form of management is easiest carried out on well-subdivided farms. With the increasing demands of pregnancy the quality and quantity of the feed given during July should gradually be improved. A procedure such as that described will result in good feed being available at a time when it is most required by the ewe.

—J. A. GRAHAM

SOUTH ISLAND FAT LAMB FARMS

DESPITE the fact that by the judicious use of nitrogenous fertiliser and short-rotation ryegrass the period of pasture production has been extended, supplementary feeding with hay and turnips or swedes and in some instances silage is still necessary on most farms. The feeding off of turnips or swedes should be commenced before pasture growth has

ceased, as close, hard grazing of grass paddocks carried on into winter has a very adverse effect. It contributes to the ingress of field daisy, and another undesirable result is that the paddocks treated in this way are very slow in making growth in the following spring. Hoggets should be put on to the swedes early, usually in early May, and it is advisable to have some of the softer fleshed, early maturing swedes such as Superlative available for the hoggets at this time. The swedes or turnips should be fed off in breaks, keeping the hoggets ahead of the ewes, so that they have the benefit of clean breaks as much as possible. The size of the breaks will vary according to the number of sheep, and they should be of sufficient extent that the turnips or swedes do not become fouled. Grazing off should be done in the order of maturing of the varieties grown, the Wilhelmsburger being grazed last. Sheep should not be put on to turnip breaks while there is frost on the tops, and it is advisable to keep them off during any extended period of wet weather. It is usual to provide a run off and to feed hay to supplement turnips. The most satisfactory and least wasteful method is to feed hay out in portable racks. If silage is being used, sufficient should be given each day so that it is cleaned up quickly without waste; this is particularly important where the sheep have not had silage previously. Generally, hay should be fed in conjunction with silage, unless it is found that the hay is neglected. Short-rotation ryegrass paddocks which are being held in reserve for the feeding of the ewes during the latter part of winter should be kept under observation. If it is found that the ryegrass is showing signs of bleaching in the bottom (this is due generally to excessive growth), the paddock should be grazed immediately. If it is not grazed at this stage, it will lose much of its nutritive value, and consequently will not fulfil the purpose for which it is being saved. Grass is the most natural feed for sheep and the sooner they can be taken off supplementary feed and given access to it the better.

—W. FAITHFUL

BREAK FEEDING OF TURNIP CROPS

BREAK feeding techniques vary according to the type of farming with which they are associated and the relative availability of root crops and pasture, greenfeed, hay, or silage. To avoid an undue check and ensure steady growth hoggets should be provided with adequate supplementary feed throughout the full period of pasture shortage. Hoggets should be introduced to supplementary feed as early as possible, as their teeth will have to stand up to turnip feeding until the start of spring pasture growth. To avoid the difficulty sometimes experienced in encouraging hoggets to eat roots, and the resultant unthriftiness, the flock should be shut on the first break for a week without run off to pasture or provision of hay. Similarly any stragglers brought in later should be confined to a separate break for a week before being turned in with the main flock. Breaks will vary in size according to the quality of the crop and the number and type of sheep. Run sheep should never be confined on small areas even if the crop is high yielding, and hoggets should not be left on a break which has become dirty. They should be provided with a fresh break before the roots are eaten to soil level, older sheep being used to clean up the remainder of the crop. The ewe flock may if necessary be kept on a minimum ration in the early winter in order to conserve sufficient of the root crop to meet their increasing requirements in the more critical period, the last 6 weeks of pregnancy.

—S. M. J. STOCKDILL

If you switch to

DRY DRENCHING
with "PHENOVIS"

Phenothiazine Pellets

You'll Drench Quicker
And Minimise The Risk
Of Wool Staining.

THIS scientific phenothiazine
DRY drench has won New
Zealand-wide praise.

"PHENOVIS" Pellets are safe,
accurate, labour-saving. Accurate
dosage is certain because each
contains exactly 5 grammes of
phenothiazine. The dose, given by
a special instrument, ensures no
"spit-out" and minimises risk of
wool staining during drenching.
Easier to carry than heavy
liquids—and there's much less
chance of waste. Order now for
the season ahead.

Distributors:

SUMMIT PRODUCTS LTD.

Box 328, Palmerston North.

**SPEEDWAY
STERILISER**

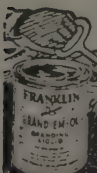


BURNS OIL OR WOOD

Write for FREE
Illustrated Catalogue
SPEEDWAY PRODUCTS LTD.
26 ALBERT STREET, AUCKLAND
P.O. BOX 159 and at
FORD BUILDINGS, COURTENAY PLACE
WELLINGTON
156 MANCHESTER ST. CHRISTCHURCH

STEAM & BOILING WATER

**FRANKLIN
BRAND-EM-OL**



FARMERS! NO MORE FIRE-BRANDING
Brand Your Cattle with

BRAND-EM-OL

the proven Fluid Brand. Used by all
the leading Herd Improvement
Associations in New Zealand.

QUICK — PAINLESS — ECONOMICAL
PERMANENT

Obtainable at all Stock and Station Agents,
Hardware Stores and Dairy Companies, or
write for prices and full particulars to

EBOR SUPPLY CO.

P.O. BOX 594.

HAMILTON

STRUCSTEEL^{REGD.} UTILITY SHEDS

FACTORY-MADE FARM BUILDINGS

YOU can have
one up and in
use in 7 days!



Send today for free
illustrated literature.

"Strucsteel" Farm Buildings available in a large range
of sizes for Hay Barns, Implement Sheds, Workshops, etc.
Corrugated Galvanised Iron Walls if required.



L. J. FISHER & CO. LTD.,
P.O. BOX 1729, AUCKLAND.
Please send full details of
Strucsteel Farm Buildings.

Name

Address

JA/5.

"Strucsteel" Utility Sheds, as above, are available in
lengths of 36ft., 54ft., 72ft., 90ft., etc., and widths of 18ft.
Front height 11ft., rear height 9ft. 6in. Ideal for Ferti-
liser, Implement and general storage purposes.

N.Z. DISTRIBUTORS:—

L. J. FISHER & CO., LTD.

30 ANZAC AVENUE, AUCKLAND, C.I. PHONE 49-148.

116 HEREFORD ST., CHRISTCHURCH, P.O. BOX 1263.
PHONE 69-994.

For only

1/6

per month
you can feed
a 2oz. daily
ration of



this highly concentrated food. It contains absolutely no
fibre—that is why such a little is necessary to balance up
your rough fodder with the essential food elements which
are lacking at this season of the year. Keep your hoggets
growing through the winter with a daily ration (1½ ozs.
will work wonders).

MOLACTRATE
PROTEINISED MOLASSES
BLOCK
THE STOCK FOOD THAT FEEDS ITSELF

Improving Winter Egg Production of Household Poultry

MANY household poultry keepers become very disappointed when they find that their laying birds are not producing enough eggs during winter to meet the requirements of the family. High production cannot normally be expected over this period, as the natural laying period for any bird is during September, October, and November. However, as eggs reach the highest price of the year over winter, it is essential that the householder should obtain the best practicable winter egg production from his flock. Numerous factors affect such production and in this month's article for the household poultry keeper, H. H. Watson, Poultry Instructor, Department of Agriculture, Wellington, recommends practices to achieve better results.

BIRDS require good housing to give them shelter from the weather and comfort. Birds that are expected to lay throughout the cold winter months require first-class environment, including dry conditions, adequate ventilation with freedom from draughts, maximum light, and sufficient perching space.

The fowl house should be high and dry and protected from draughts. Any openings in the building that cause a direct draught on the birds, particularly when they are perched, should be attended to. Additional light can be gained in a fowl house by painting the interior walls and roof with a light paint or by whitewashing them. Houses painted on the interior give birds longer to spend feeding or scratching in the litter.

When birds are on the perches for a long time a greater proportion of the food eaten is required for body maintenance and fewer eggs are produced. Adult birds should have enough perching space; 6in. to 7in. should be provided for light breeds and 8in. to 10in. for heavy breeds.

Floor Litter

A dry floor with a good depth of litter is necessary to keep birds warm. The litter can comprise straw or wood shavings or a combination of both. A depth of 6in. to 8in. of litter should be built up during autumn, as fresh litter placed in the fowl house during winter is liable to take up moisture and become damp. Dampness in a laying house leads to colds among the birds, which are detrimental to egg production. If a good dry litter is built up in the fowl house before winter, the house should not be cleaned out until after winter unless it is essential.

Stock

The age and breed of birds kept are very important factors in winter production. Pullets or birds in their first laying season can be expected to give reasonable winter production. Normally heavy breeds, such as Australorps, give better winter pro-



A good depth of dry litter on the floor of the laying house is essential. The litter on the floor shown is a combination of straw and wood shavings that have been broken down by the birds. [Niederer]

duction than light breeds, though total egg production over the year may be similar for both types. Pullets hatched during August and September are usually the best age of bird to keep, as they come into production when eggs are getting dear. Pullets hatched later than September normally develop slowly and often come into production rather late.

Many household poultry keepers retain a large proportion of their birds for more than one laying season and some go as far as to keep them for several years. These birds normally moult during autumn and are not back into production until July.

The older a bird becomes the fewer eggs she will produce in a season. Normally it is not economical to retain laying birds for more than two seasons.

A recommended practice is for householders to replace portion or all of their birds each season. This ensures that a supply of fresh eggs is available during winter. The replacement stock should be ordered from a reputable poultry breeder well in advance of the hatching season, as this avoids getting tail-end-of-the-season and late-hatched stock. In the choice of breed to keep consideration must be given to the better winter production of the heavy breeds and to the fact that at the end of the laying season these birds are better for table purposes.

Feeding

Food should be in adequate supply and quality as good as possible. It has frequently been proved that it does not pay to supply high-producing birds with poor foodstuffs. It is customary to feed mash and grain. Mash can be fed either dry or moistened. The manner in which it is fed will, under normal circumstances, have little or no effect on winter egg production. It is very important when buying ready-mixed mashes to stipulate whether a No. 1 or a No. 2 laying mash is required, as No. 1 mash contains 10 per cent. of meat meal (high-quality protein) whereas No. 2 mash contains none. Winter production cannot be maintained on a No. 2 laying mash unless at least 10 per cent. of meat meal is added to it. This means that if No. 2 mash is used, meat meal must be purchased separately and 1lb. of this meal added to every 10lb. of mash.

As an aid to increased winter production the following programme of feeding is suggested:—

Early morning feed: A small amount of wheat or mixed grain. Allow from ½oz. to 1oz. per bird each morning.

Noon: A meal of moistened mash fed in a V-shaped trough. As much should be given as the birds will eat readily in 20 to 30 minutes.

Late afternoon feed: As much wheat or mixed grains as the birds will eat in about 20 minutes. In addition the

fowl house should contain a dry mash hopper kept filled with mash to which the birds should have access throughout the day. Extra meat meal apart from that contained in or added to the mash should be fed ad lib. to the birds. This food could be placed in a section of the mash hopper or in a separate container. The additional meat meal eaten by the birds during the cold months will stimulate egg production.

When moist mash feeding has been confined to winter (from May to August) it may be discontinued in spring (from late August onward). The feeding of this mash should not be stopped abruptly, and approximately 10 days to a fortnight should be allowed for the birds to be weaned off moist mash. This can be effected by reducing daily the amount fed to the birds.

Pellets

Poultry pellets can take the place of dry mash, as this type of feed is satisfactory for laying pullets. Pellets can give a greater consumption of food to birds in winter than can dry mash feeding.

All birds require an adequate amount of vitamin A in their diet and usually this is provided by giving them a supply of greenfeed such as lawn clippings or leaf vegetables. During



Above—A house with excellent light and ventilation. Factors such as these help to improve winter production. Below—A house with filthy surroundings, very little light, and poor ventilation. It will be damp and cold inside during winter.



autumn and winter it becomes very difficult to find sufficient greenfeed and that available may be of poor quality.

Rather than risk birds receiving an inadequate intake of vitamin A from poor-quality greenfeed it is advisable to augment the diet with fish oil, which is rich in vitamins. The oil can be mixed into the mash or the grain at 2 tablespoons to every 5lb. of total food given to the birds. The oil should

be mixed into the ration daily, as it loses much of its vitamin value when left exposed to the air. Many poultry pellets sold today contain vitamins including vitamin A. Care should be taken to ensure that vitamin A has been included; otherwise an additional source should be provided.

Effect of Lights

Experience has shown that artificial lighting for laying birds during winter

gives increased egg production during that period, though not necessarily more eggs over the complete laying season. Apart from the additional food consumed by the birds during the period of artificial lighting the major factor in increasing production is the light, which stimulates the birds' pituitary glands. Where it is practical for householders to fix an electric light in their fowl house the following information may be of assistance:—

The simplest and an effective method is to bring a light on in winter about 2 to 3 hours before there is natural light. The object is to give the birds 12 to 13 hours of natural or artificial light in every 24 hours. The use of artificial light should be started during April or May and the period of lighting increased gradually until the shortest day, after which it should be decreased gradually until approximately mid-September, when lighting may be discontinued.

Lighting in this manner can be effected with an alarm clock and an ordinary type of electric light switch from which the spring has been removed, the key of the alarm on the clock being used to strike the switch and so bring on the light. The light can be switched off when the birds receive their main morning meal after daylight.

The light within the fowl house should be suspended from the roof and a 40-watt bulb covered by a shade should give sufficient artificial light for a small number of birds. The light should be concentrated to shine over the food and water. As soon as the light goes on the birds will come down from the perches to drink and eat.

The purpose of artificial lighting is to increase winter egg production. As more food is required to produce more eggs, food should be available for the birds when the lights come on.

Topdressing in Waimarino County

By A. K. BOOTH, Instructor in Agriculture, Department of Agriculture, Wanganui

ONE of the most important features in farming today is pasture topdressing. Topdressing in the past has been mainly confined to flat and undulating areas, but in recent years fertiliser has been applied to hill country pastures in increasing quantities. The Extension Division of the Department of Agriculture has been conducting topdressing trials for many years and these, with soil testing, enable it to advise farmers on the correct fertiliser programme to follow.

WAIMARINO COUNTY, situated on the western uplands of the North Island, extends from the Wanganui River in the west across Mount Ruapehu in the north to Waiouru in the east. The type of country varies from flat to undulating on the plateau to the moderately steep ash-covered and steep sandstone and mudstone country south and west of the plateau. Tongariro ash-covered soils, which were originally in broadleaf forest, make up the major part of the 216,000

acres of sown grassland in the county. It is this area that holds the brightest future for potential increases in carrying capacity. The county lies approximately 2000ft. above sea level, has a cold winter climate, a well-distributed rainfall of about 60in. a year and seldom suffers from summer dry spells. Except in the low-lying swampy areas where grit pan forms an impervious layer, drainage is not a real problem on these volcanic soils.

Responses on Tongariro Ash Country

This article is based on the results obtained from a number of topdressing and oversowing trials which were recently completed in the Raetihi district. The sites selected for hill country trials were moderately steep hill faces typical of a large area of ash-covered sandstone. A uniform hill slope with no variation in fertility and pasture composition was selected for each trial so that a fair comparison could be made between the various treatments and a control or "no manure" area. Dominant species in the unthrifty native pastures were browntop, danthonia, and Yorkshire fog, with flat weeds, moss (southerly faces), and traces of suckling clover, white clover, and *Lotus major*. Before the trials were laid down in the spring of 1950 little or no topdressing had been applied to the pastures. It was evident from soil tests on soil samples taken from those trials that the potash levels were low and the phosphate levels very low. Except on the southerly faces the lime status was satisfactory. Each plot was 1/100 acre and the treatments carried out were as follows:—



Fertiliser	Phosphoric acid content per cent.	Rate per acre cwt.
1. Control or no manure		
2. Basic slag	20	3
3. "Fertiphos"	40	1½
4. North African phosphate	27	3
5. Serpentine superphosphate	15	3
6. Superphosphate	21	3
7. Superphosphate and muriate of potash	21	2
8. Muriate of potash		2

HEADING PHOTOGRAPH: Part of Waimarino County.

*Equip your
milking machine
throughout with*

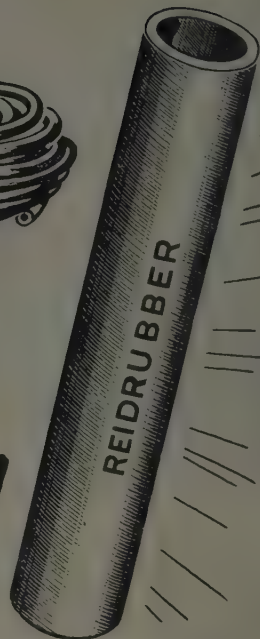


Reidrubber

MILKING RUBBER



*-it's Best
by Test!*



MR 55-1

MADE BY REID NEW ZEALAND RUBBER MILLS LIMITED

Fraser's di-tergol[★]

ALKALI-ACID DETERGENT
FOR CLEANING MILKING
MACHINES

★ Di-tergol detergent is guaranteed to comply with the Ruakura B-Type specification and is recommended and approved by the Dairy Division.

Prices: Alkaline Powder:
18/6 per 7lb. tin. Bulk
price 2/6 per lb. in 28lb.
tins.

Double Strength Acid Powders: 11lb. tin
7/-; 7lb. tin 42/3

Ask your local Dairy Co., Stock and
Station Agent or Store.
Mfrs. Fraser Products Ltd., Auckland

RAT DETH

RATS CAN'T RESIST

Rat-Deth

Tear perforated flap at bottom of carton and bait flows freely. The only rodenticide that has automatic dispenser. No personal contact with bait. Obtainable from all stores.

Rat-Deth

Manufactured by Fraser's Products Ltd., Auckland.



Moderately steep ash-covered sandstone in the Raetihi district where spectacular responses were obtained from phosphate-potash topdressing and clover oversowing.

Half of each plot was limed at a rate of 5cwt. to 10cwt. per acre according to the estimated lime requirement for that particular trial area.

As pasture responses are mainly recorded as clover in the sward, it was necessary to introduce oversown clover into the experimental plots. Half of each plot was oversown with 2lb. of white clover and 1lb. of *Lotus major* per acre, thus giving combinations of all the phosphate treatments with and without lime and oversown clovers. Further fertiliser applications were made annually at the same rates as the initial dressings. At regular inspections every 3 months details of the changes and improvements and other relative information on the pastures were recorded with each plot's difference from the no manure plots.

Superphosphate and North African phosphate were the best of the phosphate treatments and there was little difference between the two. Serpentine superphosphate gave a fair res-

ponse and was slightly better than "Fertiphos" and basic slag. The responses to phosphate on the oversown halves of the plots were much superior to the responses on the halves where clover was not oversown. There was no response to potash topdressing alone, but there was a decided response to it when applied with superphosphate. The clover growth on the superphosphate plus potash plot was the best of the trials.

A small lime response was recorded in the early stages of the trials, but it was not consistent and did not show up in the latter stages.

Recommendations for Pasture Improvement

For pasture improvement the following steps are recommended:—

1. To utilise fully the applied fertilisers the pasture must contain sufficient clover. Certified white clover should be oversown with the initial phosphate dressing at 2lb. per acre, and

where there are large areas of cold, shady faces $\frac{1}{2}$ lb. of *Lotus major* per acre should be included in the mixture.

2. The most economic form of phosphate to apply is superphosphate, which should be applied at 2cwt. per acre annually. Though good results can be expected from North African phosphate, it is more costly per unit of phosphoric acid than is superphosphate. Where the fertiliser has to be stored for any length of time serpentine superphosphate may be considered because of its superior physical and handling qualities.

3. Muriate of potash should be applied at 1cwt. per acre every 3 years to get the maximum production from the pasture. Continued good responses cannot be expected from phosphate alone—both potash and phosphate topdressings are required. The best results from potash are obtained from spring rather than autumn sowing.

4. Lime is not the limiting factor at present, because of the low phosphate and potash levels.

Responses on Grit Pan Swamp-land

A trial which was recently completed on the grit pan swamp-land in the confines of Valley and Middle Roads, 5 miles north of Raetihi, compared various phosphates, potash, and lime. This trial was laid down after an inspection of the pastures revealed a very small response only to considerable phosphate topdressings over a number of years.

The pasture was poor perennial ryegrass, cocksfoot, Yorkshire fog, and

SUMMARY OF TOPDRESSING TRIAL RESULTS

Soil type	Super-phosphate	Basic slag	North African phosphate	Serpentine super-phosphate	Superphosphate plus	
					"Fertiphos"	Potash
Tongariro ash 65H Lime	2 $\frac{1}{2}$	N.A.	N.A.	1 $\frac{1}{2}$	1 $\frac{1}{2}$	3
No lime	2 $\frac{1}{2}$	N.A.	N.A.	1 $\frac{1}{2}$	1 $\frac{1}{2}$	0
Tongariro ash 65H Lime	3	1 $\frac{1}{2}$	3	2	1 $\frac{1}{2}$	3 $\frac{1}{2}$
No lime	3	1 $\frac{1}{2}$	3	2	1 $\frac{1}{2}$	0
Tongariro ash 65H Lime	2 $\frac{1}{2}$	1 $\frac{1}{2}$	2 $\frac{1}{2}$	2	2	3
No lime	2 $\frac{1}{2}$	1 $\frac{1}{2}$	2 $\frac{1}{2}$	2	2	0
Grit pan swamp-land 100b Lime	2	1	2	1 $\frac{1}{2}$	N.A.	4
No lime	2	1	2	1 $\frac{1}{2}$	N.A.	0

1 = Slight response. 2 = Fair response. 3 = Good response. 4 = Very good response.
5 = Excellent response. N.A. = Not applied. Half points are also used, for example, 1 $\frac{1}{2}$ = Slight to fair response.

**Only your TYRES can harness
your tractor power to the soil!**



If your soil conditions require an open centre tyre use the most advanced open centre tyre on the market—the Firestone Curved Bar! Tread Bars are Curved and Tapered to take a sharper, stronger bite; and flared to permit more positive self-cleaning.

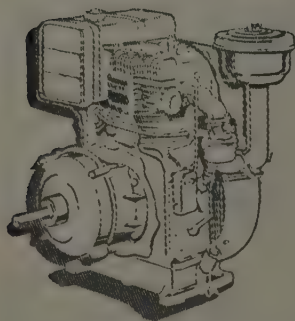
Thousands of farmers the world over use the famous Firestone patented Traction Centre tyre because they've found that this tyre performs best in the soil conditions on their particular farms. The Firestone Curved Bar Traction Centre may be the answer to your problem.

Firestone *CHAMPIONS*

Fit Firestone for outstanding tractor performance

Now is the time!

**KEEP THAT BRIGGS & STRATTON ENGINE
Constantly *IN SERVICE***



Brown Bros.
ENGINEERS LTD.

Brown Bros. Engineers Ltd. regret that present conditions make the B. and S. Engine supply position restricted—but the service on existing engines is as complete as ever! However, if you really need a new B. and S. Engine advise us, we may be able to assist in the reasonably near future.

Our B. and S. Engine service engineers are equipped with factory recommended tools to completely overhaul and service all B. and S. Engines. If your engine needs attention, let us know. Prompt advice will be given on receipt of details of the engine condition.

A complete range of spare parts is always stocked. This covers every conceivable spare for every B. and S. model—down to the most minute part! Call or write for your spare part needs, stating the engine model, type and serial number.



(Sole N.Z. Distributors for B. and S. Engines)
590 COLOMBO STREET. P.O. Box 548J
CHRISTCHURCH. Telephone 65-195

sweet vernal with a small amount of white clover. The paddock had been ploughed out of old grass, a crop of swedes had been taken, and the paddock was in second-year new pasture when the experiment began. Blood and bone at 4cwt. per acre had been sown with the swedes and 2cwt. of superphosphate per acre with the new grass.

Treatments included in the trial were superphosphate, basic slag, serpentine superphosphate, superphosphate and muriate of potash, and muriate of potash alone. The phosphates were applied at 3cwt. per acre, the potash at 2cwt., and half of each plot was treated with 1 ton of lime per acre. Oversowing with clover was not required, as there was sufficient white clover in the pasture.

Definite responses were recorded, the superphosphate-potash topdressing giving the best results. The results are summarised as follows:—

Phosphate: Of the phosphate treatments superphosphate was slightly superior to serpentine superphosphate, which in turn was better than basic slag. Though the difference between superphosphate and serpentine superphosphate was small, it was definable.

Potash: Initial soil test results indicated that potash was deficient, and observations throughout the trial have proved this. There was a response from an initial dressing of potash alone owing to the build up of phosphate by previous topdressing. However, this temporary improvement was halted and there was a progressive decline as phosphate became the limiting factor until there was no response from potash alone.



A control area on ash-covered sandstone hill country after 2 months' autumn growth. Browntop and danthonia are dominant, with flat weeds and a small amount of white clover and *Lotus major*.



Two months' autumn growth on an area oversown with 2lb. of Certified white clover per acre and topdressed twice with 3cwt. of superphosphate and 1cwt. of muriate of potash per acre over 18 months.

A very good response was obtained from applications of superphosphate and potash together. The pasture improvement was very noticeable from 1 to 3 months after topdressing, and the sward in the superphosphate-potash plot was far superior to that in the other treatments. The improvement was mainly in the amount and vigour of the clover, particularly white clover, and also in the colour and vigour of the grasses.

Lime: A doubtful response was recorded in the early stages of the trial, but a response was not apparent after the first 12 months.

Recommendations for Pasture Improvement

To maintain a first-class pasture annual dressings of 3cwt. of superphosphate and 1cwt. of muriate of potash per acre are required. It is essential to apply both fertilisers, as the omission of one or the other will seriously affect the growth of an old pasture or the establishment of a new one. For the successful establishment of a new pasture superphosphate must be applied at the time the grass seed is sown and a dressing of potash must be applied in the first year, preferably in spring.

Soil Test Figures

Soil analysis has an important place in topdressing trials. From samples taken before the trials were put down the initial levels of lime, phosphate, and potash were ascertained. Visual responses to the various fertiliser applications were recorded, and with further soil tests after several years' topdressing a picture of the effect of the applications of fertiliser on soil test was obtained. The following table is a record of the analyses from these trials:—

TONGARIRO ASH FLAT AND HILL COUNTRY (SOIL TYPES 65 AND 65H)			
	pH	Phosphate	Potash
Control, 14/10/50	5.8	0.0 (very low)	Low-medium
Lime, superphosphate, and potash (4 treatments), 30/6/54	6.4	6.0 (medium)	Low-medium
GRIT PAN SWAMP COUNTRY (SOIL TYPE 100B)			
Control, 24/10/50	5.9	1.7 (very low)	Very low
Lime, superphosphate, and potash (4 treatments), 7/9/53	6.4	3.0 (low)	Medium

In spite of only small rises in the phosphate and potash tests, the pasture production was satisfactory. Therefore good pasture production is compatible with low to medium soil phosphate and potash levels, provided maintenance dressings are applied regularly.

Liming had a marked effect on reducing soil acidity, but this had little effect on pasture production.

More Fertiliser Recommended

The key to future development and the subsequent increase in stock numbers in Waimarino County appears to lie in the use of more fertiliser. With the introduction of aerial topdressing and bulk handling of phosphate the most economical type of fertiliser and rate of application become important to every farmer.

On the unploughable country the first consideration must be the introduction of sufficient clover to the sward to utilise fully the subsequent topdressing. Phosphate is the limiting factor initially and is most economically applied in the form of superphosphate. Where the land is ploughable a pasture renewal programme should be adopted and the topdressing should be intensified on these new grass areas with both superphosphate and potash. Once the older pastures have reverted to browntop dominance the return per unit of topdressing is much lower than with the more vigorous grasses and clovers in a new pasture.

Danger in Storing Seeds near Weedkillers

By A. B. COOK, Research Officer, Department of Agriculture, Wellington

AN experiment was carried out recently by the Department of Agriculture to find if it was possible to keep bulk stocks of weedkillers and seeds in the same storeroom without harming the seed. Small bags of seed of timothy, perennial ryegrass, and Montgomery red clover were kept in a storeroom in Wellington near stocks of weedkillers kept for experiments.

SAMPLES of seed from these bags were sent at fortnightly intervals to the Department's Seed-testing Station at Palmerston North for germination tests. Control samples of seed from the bulk stocks from which the bags of seed had been taken for storage were sent for testing at monthly intervals. This bulk seed was stored free from any possible contamination from weedkillers. The experiment lasted 5 months 14 days, during which time 12 lots of seed were taken for germination tests. The weedkillers in the storeroom were the whole of the experimental stocks, including M.C.P.,

2,4-D, 2,4,5-T, D.N.B.P., I.P.C., T.C.A., and C.M.U.

Results of Trial

The table shows the results of germination tests at the beginning, middle, and end of the sampling period.

Timothy: Both the control seed and that used in the experiment deteriorated, the seed being of poor germination to begin with. It seems to degenerate fairly rapidly wherever it is stored and it was unfortunate that it was chosen for the experiment.

Montgomery red clover: Both the control seed and the seed stored near

weedkillers deteriorated slightly during the experiment.

Perennial ryegrass: From the germination results it seems that this seed was probably affected by being stored near the weedkillers. Though the germination figures were erratic, there was a decided decrease in the germination percentage and an increase in the abnormal growth percentage in the seed stored near weedkillers. The germination figures for seed stored away from weedkillers remained constant throughout the trial.

Storage Precautions

The weedkillers causing the damage were probably the volatile formulations of 2,4-D, such as the ethyl or butyl esters, and the volatile D.N.B.P. and I.P.C. preparations. To a less extent the butyl esters of 2,4,5-T may also have caused damage. It is doubtful whether the low volatile materials such as T.C.A., C.M.U., and the less volatile esters of 2,4-D and 2,4,5-T would affect the germination of the seed.

Though deterioration in germination was caused only with perennial ryegrass and though only one experiment has been conducted, the results are considered sufficiently important to issue a warning not to store seed and weedkillers near each other in the same room. This would apply particularly where opened tins of weedkillers are kept. More comprehensive trials on the effect of weedkillers on the germination of seed are being carried out at the Seed-testing Station.

Seed	Date	PERCENTAGE GERMINATION OF SEED				SEED			
		Stored near weedkillers		Stored away from weedkillers		Stored near weedkillers		Stored away from weedkillers	
		Germination per cent.	Abnormal growths per cent.	Germination per cent.	Abnormal growths per cent.	Germination per cent.	Abnormal growths per cent.	Germination per cent.	Abnormal growths per cent.
Timothy	9/6/54	—	—	—	—	51	10	39	—
	23/6/54	49	4	47	—	—	—	—	—
	1/9/54	41	14	45	33	25	42	—	—
Montgomery red clover	24/11/54	27	14	59	19	14	67	—	—
	9/6/54	—	—	—	—	81	3*	9	—
	23/6/54	84	3*	6	7	—	—	—	—
Perennial ryegrass	1/9/54	69	5*	17	9	75	1*	10	14
	24/11/54	68	3*	16	14	68	3*	14	13
	9/6/54	—	—	—	—	88	1	11	—
	23/6/54	85	0	15	—	—	—	—	—
	1/9/54	63	20	17	90	0	10	—	—
	24/11/54	26	62	12	88	0	11	—	—

* Indicates hard seeds which are viable but have not germinated.

Planting Technique

BECAUSE of the importance of trees on the farm as shelter and for timber, planting of them should be planned and carried out carefully. Planting 500 trees a day properly is infinitely preferable to planting 750 a day in a manner which might require replacement of trees lost through failure to strike. This article by W. H. Jolliffe, Officer in Charge, Extension Forestry, New Zealand Forest Service, on planting technique is the third of a series on trees on the farm, the previous two articles having appeared in the March and April issues of the "Journal".

THE best general tree planting tool is the grubber or mattock. In free soils such as pumice, sand, or sandy loam a spade may be preferred; in very stony land a tool shaped like a spear will be found a great help.

In wet localities a common practice is to dig a big sod, turn it upside down on the ground, and plant in the mound so formed. In dry places the reverse is sometimes done; that is, the tree is planted in the pit formed where the sod has been removed. However, the young tree must not be buried deeper than it was in the nursery.

The main points in planting are to see that the roots are directed downward and not bent unnaturally; to insert the plants to the same level they were in the nursery; to fix the plants firmly in the ground and see that the roots are not hanging in an air pocket; and to keep the roots of young trees moist in transit. Time taken in grubbing away a dense mat of grass and

pulverising the soil to the full depth of the grubber will be time well spent.

The numbers of trees required per acre for various spacings are:—

Distance apart	Number of trees per acre
ft.	
4 x 4	2,722
5 x 5	1,742
6 x 6	1,210
7 x 7	889
8 x 8	680
9 x 9	537
10 x 10	435
12 x 12	302

Spacing of planting may vary from say 6ft. x 6ft. to 12ft. x 12ft. according to the purpose for which the trees are grown, to the species, and to the likelihood or otherwise of any further treatment being given. Generally the closer spacings are preferable, because a continuous leafy canopy is formed at an earlier age. This results in earlier suppression of weed growth, the im-

provement of the climate close to the ground, the early suppression of side branches (which are thus kept small), and the incentive to increased height growth. However, close plantings must be followed by early thinnings to avoid the formation of a forest of tall, thin, whippy trees interspersed with numerous dead or dying ones.

Wide spacing (10ft. to 12ft.) results in slower formation of a continuous leafy canopy. This means that height growth is not so fast (though stem diameter growth is hastened) and side branches grow unrestricted unless removed by pruning. However, where thinning is not possible it is better to accept these disadvantages than to have the stagnation of an unthinned, densely packed plantation.

Wrenching and Lifting Young Trees

Wrenching and lifting are practices which should be carried out carefully by farmers who raise their own planting stock.

Because a long taproot can suffer serious damage during transplanting, it has become the practice to cut it back at a time that permits growth of a system of fibrous rootlets before the tree is moved. The operation is known as wrenching and is performed by driving in a sharp spade on each side of a band of trees at as flat an angle as possible to cut all the taproots at about 4in. below the surface. The spade handle is then pressed down to raise the clod of trees clear of the bed and then the clod is let back into its old position by the removal of the spade. This operation is repeated for the full length of each of the bands. It is easier if two men with spades are available for this job.

Wrenching is normally done after a heavy fall of rain 2 to 3 months before planting is intended. Wrenching may also be done to check too rapid growth, which would result in unwieldy planting stock.

Lifting is done with a spade, preferably after rain and on an overcast day. The loosened clod is lifted out by a firm grasp of all the trees rising from it. The soil is shaken from the clump and then the individuals are carefully disentangled, culled, and bundled into lots of handy size. In culling, care should be taken to reject all poorly rooted plants, those lacking a healthy colour, or those which have no definite leading shoot. It is better to lose plants at this stage than after labour has been spent on planting out unthrifty stock.

If it is not possible to send the trees direct to the planting ground, the roots must be puddled in a mud bath about the consistency of gruel and the bundles heeled in in a sheltered place. It is imperative that plant roots be kept moist from the time of lifting from the nursery to the time of planting in their permanent location.



Root pruning and puddling of young trees in a nursery.

Introducing
the first

AUTOMATIC DRENCHER

Phenothiazine

with built-in
Stomach Tube!



PREMIER PHEN-MASTER

It's the first of its kind . . . specially built, not merely adapted for internal (oesophageal) drenching. The stomach tube is pre-directed and self-guided down the gullet. It's fast, clean and accurate. It ends wool-staining. There's no irritation or discomfort for the sheep. And it's safe—hundreds of thousands of sheep have been drenched by Premier pre-directed tubes without a single report of the tube entering the windpipe. Fully illustrated instructions supplied with each instrument. Available from stock firms everywhere.

N.Z. DISTRIBUTORS

PREMIER PRODUCTS

LIMITED

WELLINGTON

PR.6

*ARE YOU?

More than 15,000
N.Z. Dairy Farmers
are...*

using the

'Ruakura' VACUUM REGULATOR



Why? Because they obtain Maximum yield from their Herds without risk of udder injury.
Recommended by Ruakura Research Station;
Approved by Shinfield (England);
Awarded silver medal London Dairy Show, 1953;
Certificate of Merit, Bath and West Show, England, 1954.

Order from your milking machine maker or supply house, stating setting required.

PRICE **62/-** each.

Manufactured by PLASTIC PRODUCTS LTD.,
HAMILTON, NEW ZEALAND.

For Quality

AND ECONOMY



Champion

DAIRY and PIG MEAL



AUCKLAND FARMERS' FREEZING CO. LTD.

A Simple and Easily Constructed Wax Mould

IN processing beeswax many beekeepers after going to a great amount of trouble to secure a good, clean sample of wax often spoil the final results by using a variety of sizes and shapes of receptacles as wax moulds. Not only are these blocks of wax often difficult to remove from their moulds when set, but they are various weights, shapes, and sizes and present a most unattractive appearance to a prospective purchaser. Packing for transport is also a problem, as there is so much waste space with these odd-shaped blocks. In this article L. A. M. Griffin, Apiary Instructor, Department of Agriculture, Hastings, emphasises the need for a more uniform and saleable appearance of the finished product.

THE wax mould to be described is cheap, efficient, and easily made and possesses many advantages over the variously shaped receptacles often used as wax moulds.

The most suitable size and type of tin to use for the mould is the 4-gallon or 60lb. honey tin with a small filler cap in one corner.

Care must be taken to cut the tin accurately to ensure a level, even finish to the mould when completed. The following method has been found the easiest and the most successful:—

Mark the tin diagonally on each end from one corner to another and mark down one side from one corner to that at the opposite end with a straight-edged piece of wood and pencil or scriber. Two of the side corners of the tin have rolled, soldered seams. These should not be cut but left to strengthen the base of the mould.

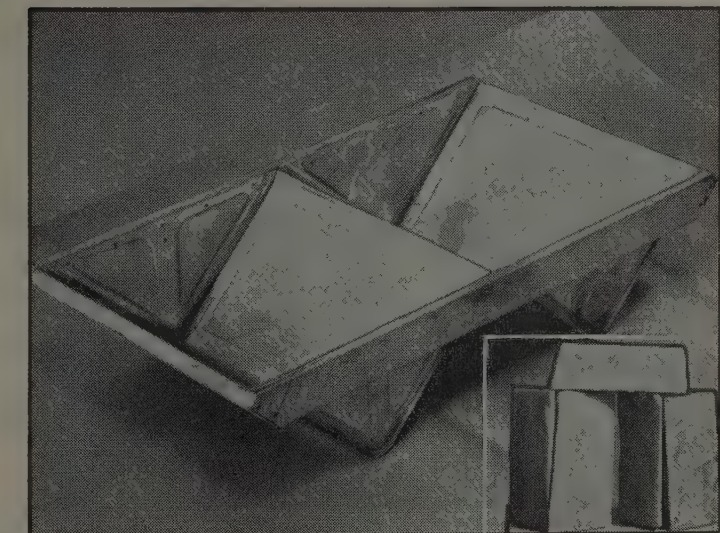
The pencil lines on the ends of the tin should therefore correspond with the side corners without seams.

The corresponding rolled edges at top and bottom of the tin—on one corner only—can now be sawn through with a fine-toothed hacksaw. One cut should be long enough to insert the width of a hacksaw blade for making the final cuts. The rest of the cutting is easily done by using a hacksaw blade fitted into a pad saw handle, with the angle of the teeth pointing toward the handle.

The tin should be held down firmly on the floor between the feet for cutting. The best results are obtained by holding the saw at an angle of 35 degrees and making slow, firm upward cuts. Each upward cut if performed correctly should cut the tin along at least 1½ in.

The side corner of the tin should be cut along first, leaving the top and bottom cuts until last. The tin will then open out like a book.

If difficulty is experienced in keeping to the marked lines, a piece of



The mould described in this article. Inset—Approximately 75lb. of beeswax moulded into five conveniently sized blocks.

wood may be used as a straight edge to guide the saw.

Cutting the tin this way leaves the sharp, burred edges facing outward. These edges can later be lightly tapped over with a hammer to press into the outer wooden rim of the mould to make a smooth, round finish.

For a neat appearance the screw filler cap should now be removed with a blow lamp or soldering iron. It is then necessary to solder a flat circular piece of tinned metal over the hole from the inside.

Four strips of wood are required for the outer rim to give strength and stability to the mould: 2 lengths each 2ft. 3in. for the sides and 2 lengths each 14in. of 2in. x ½ in. for the ends. This allows sufficient length for cutting to the exact dimensions of the tin after the wood has been fixed to the outer edges.

The two end battens should be nailed on first from the inside of the mould with 1in. nails. The nails should be staggered and the protruding points bent over and securely clinched into the battens.

The battens should then be cut to the exact dimensions of the tin, and care should be taken to ensure that the end cuts are perfectly square, or the mould is liable to have a wind or twist when made up.

The two side battens can now be nailed on in the same way. After the top edges have been levelled by eye, with the mould standing firmly on a flat, level surface, the side battens

should be securely nailed to the end battens with 2in. nails. The ends should be cut to conform with the angle of the end battens to give a neat finish.

The sharp edges of the tin can now be turned over and lightly hammered into the wooden battens, making a smooth and safe finish.

These moulds with reasonable care will give years of service, as there is no need to hammer or jar them about to extract the wax blocks after they are set. The inside of the mould should be rubbed over lightly with a clean, oily cloth before the mould is used. It is then only necessary to invert the mould for the blocks to fall out.

One of the many advantages of this type of mould is that if the wax has not been allowed to stand long enough for it to clear before it is poured into the mould, the residue that settles to the bottom of the wax is confined to the bottom V edge of the mould instead of over a large flat surface as it is in many other types of moulds. This residue is easily cut away with a minimum of waste and without detracting to any great extent from the final appearance of the product.

Each side of the mould will hold approximately 15lb. of wax. Two blocks placed close together will be approximately the size of a 60lb. honey tin. This is a great advantage when a large consignment of wax is being packed for freighting to a distant purchaser.

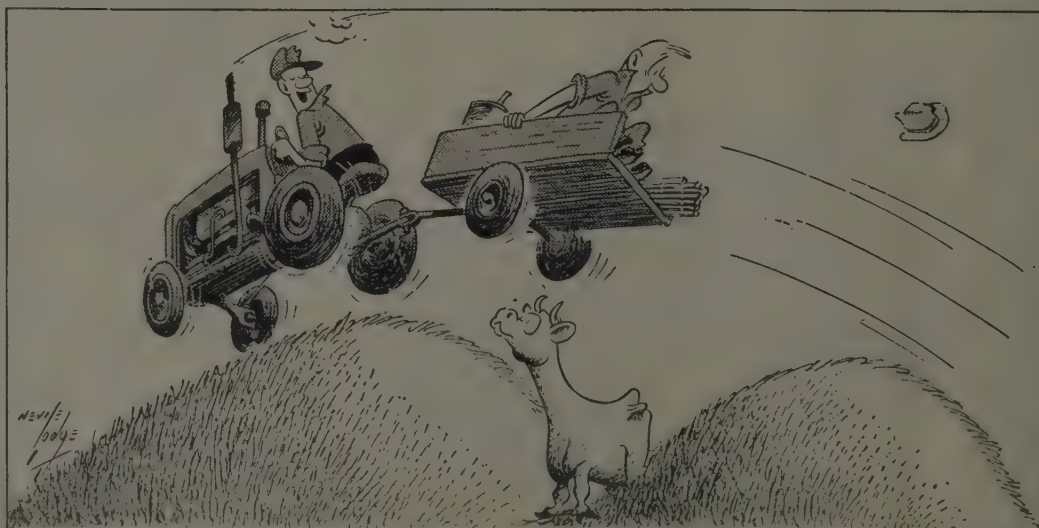


MARATHON

*Look for this
Trade Mark when you
Buy Gumboots -
it means
long wear!*

Made by:
MARATHON RUBBER FOOTWEAR LIMITED.
A manufacturing Division of Skellerup Industries Ltd.,
Woolston, Christchurch.

**MARATHON GUMBOOTS
MEAN OUTSTANDING
COMFORT AND VALUE**



"I MUST SAY THIS SHELL FUEL SAVES A LOT OF HILL WORK." TF3-5

Would you like a copy of this cartoon? Write to Advertising Division/3 The Shell Company, Box 2091, Wellington.

Soil Testing Service to Farmers

THE service to farmers started a few years ago of providing advice on the use of fertiliser based on the analysis of their soils by agricultural chemists is discussed in this article by J. E. Bell, Fields Superintendent, Department of Agriculture, Auckland. Results of a large number of field trials that had been laid down all over New Zealand on the different soil types were used in the scheme.

THE soil testing was at first done free by the Department of Agriculture, but as it was found that instructors in many districts could not cope with the demand, it was decided that the testing should be paid for. Requests for the service are made through the local office of the Department of Agriculture. Horticulturists get in touch with the Horticulture Division and dairy and sheep farmers consult the local instructor of the Extension Division, who will arrange to visit farms.

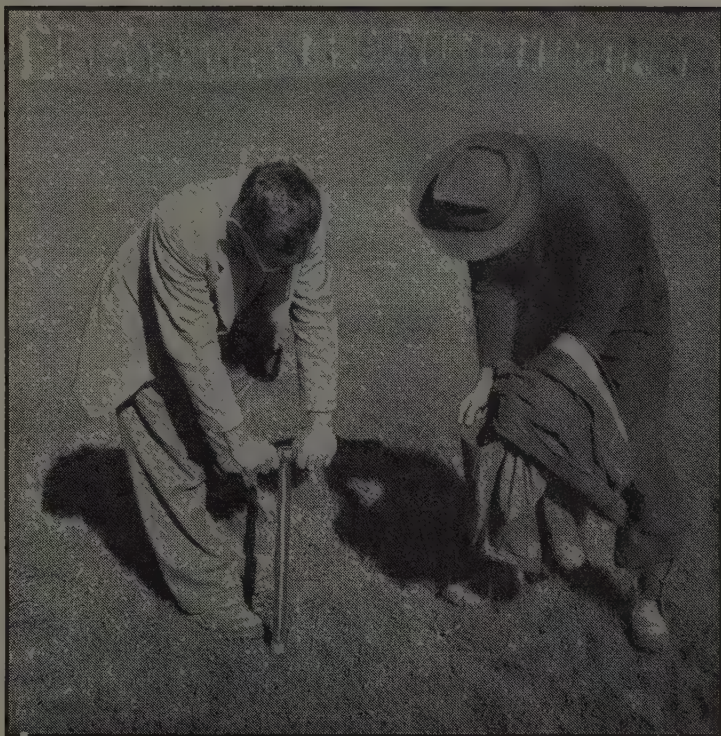
The instructor may be able to give the farmer the information he wants without taking soil samples, but generally samples are taken from about five different fields.

The fields selected usually include the poorest field on the farm, one or two more poor fields, and one or two fields of medium fertility. Sometimes a very good field is also selected. If the farm consists of different soil types, samples may be taken from each of these. In a field of two soil types two separate samples may be taken. From the results of testing these samples the topdressing needs of the whole farm may be fairly determined. Sometimes a farmer is concerned about the treatment of only one particular field and only this may be soil sampled.

The instructor collects from the farmer the manurial history of each field as far as this can be remembered. This is of value in checking the results which may be expected. For instance an instructor knows from trials the lime requirement of virgin soils of any type. If the requirement is 1 ton of lime and this has been applied recently, he will expect this to be reflected in the results of the soil analysis.

From the type of phosphate that has been previously applied he also knows what allowance to make in the soil analysis phosphate figures. Sometimes this information is not available and this is often the case when a farm has recently changed hands once or twice. The soil analysis is then very useful in checking the needs of the soil and determining the past standard of topdressing of the farm, particularly with lime.

After checking the manurial and liming history of the fields the instructor notes the soil type, the state of the pasture, and particularly the vigour of the clovers. North Island soil samples are then dispatched to the



The possession of a representative soil sample, though very important, is only the first step. This sample has to be tested for available phosphorus, potassium, calcium, and pH soil reaction.

Department of Agriculture's Rukuhia Soil Research Station, at Hamilton, and South Island samples to Winchmore Irrigation Research Station. The results are sent to the instructor, who will advise his interpretation of them on payment being made. Payment can be made any time after the samples are taken and before results are divulged. Payments are £1 for each sample up to four, and 10s. each for additional samples over four. Six samples will thus cost £5. The results show the needs of the soil for lime, phosphate, and potash. An additional fee of 15s. is charged if analysis for molybdenum requirement is asked for and granted.

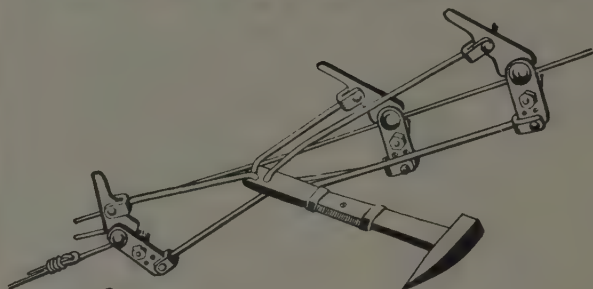
The system has worked very well, the results coming to hand generally about 3 weeks after the sampling has been carried out. Since a charge was made there has not been a decline in the demand for the service, farmers recognising that the cost is small compared with the large outlay that is made annually for fertilisers used on their farms. Because it is a paid for service, the instructor must give it first priority.

Analysis Results

The requirement of a soil for lime is determined primarily on its acidity as determined by pH. The more acid a soil is generally the greater the need for lime. Almost all soils are acid or slightly acid. A pH of 7 is neutral; figures above 7 show the soil to be alkaline and below 7 acid. In most soil types about 6.2 is considered ideal, revealing a slight acidity. If the pH is much higher than this or approaches neutrality (7), certain minor elements including boron may become less available. This occurred on a pumice soil which had been too heavily limed for the growing of lucerne. Field trials have shown that on some soils a lower or a higher pH than 6.2 is necessary or desirable, and advice on liming is governed largely by soil type. On peat soils a pH of a little over 5 has been shown to be satisfactory and on the other hand lime is still needed on much of the rolling country in the Te Awamutu district even where the pH is 6.2.

The needs of soils for calcium, phosphate, and potash are shown by numerical ratings. For instance, the figures

DONALDS



New WIRE-STRAINER

36/-
DELIVERED FREE

THE WORLD'S BEST WIRE STRAINER

No other wire-strainer has all these features:

- * New all-steel grips.
- * New combination staple puller, hammer, file and key.
- * A complete fence repair outfit.
- * Takes up an unlimited amount of wire without removal.
- * Indispensable for guiding trees when being felled, hauling logs, pulling animals or cars out of ditches, etc.
- * Over 20,000 sold last year in New Zealand, Australia, South Africa and Great Britain.
- * Guaranteed against defect or breakage.

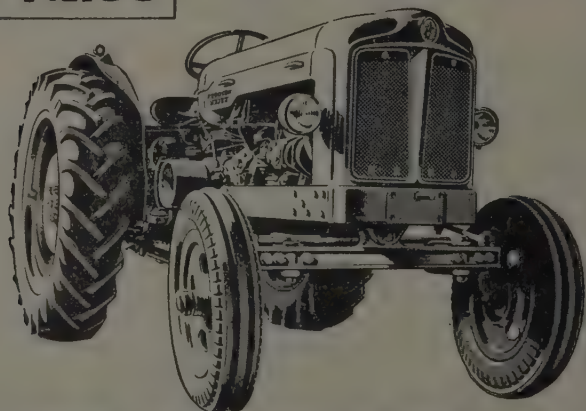
Obtainable from all stores or from

DONALD & SONS LTD.

BOX 138, MASTERTON, N.Z.

value

far above the price . . .



**FORDSON
MAJOR** 

Before you buy your new tractor consider these important facts:

- (a) With a Fordson Major you get more sheer tractor value for every pound invested. (See Fordson Major prices at right.)
- (b) You get a tractor that will pull anything on the farm—with power in reserve even in the toughest going.
- (c) Your "Major" is backed by the unequalled service facilities of 80 Ford Dealers.
- (d) You have a choice of petrol or diesel models—each a thoroughbred in its class!
- (e) Fordson Majors are built to take it . . . built to last.
- (f) But in spite of its vast power Fordson Major is amazingly economical! Arrange a Test Drive on your own farm and prove it. In every way Fordson Major is VALUE far above the price!

FORD MOTOR COMPANY OF NEW ZEALAND LIMITED
LOWER HUTT

UNBEATABLE VALUE

£553 on Steel equipped with self starter,
adjustable front and rear
£598 on Rubber tracks, independent foot
brakes, handbrake.

£677 on rubber equipped with hydraulic power
lift, automatic clutch release, P.T.O., self-
starter, adjustable front and rear tracks,
independent foot brakes and handbrake.

Any of the above models can be purchased equipped with
a diesel motor for £97 extra. Special additional equipment
available at low cost.

Delivered any Dealer Town — Terms Available. Prices
and Specifications subject to change without notice.

for potash may run from 0 upward. If the figure is below 6, responses to potash applications are probable, if it is 7 or 8, responses are possible, and if it is above 8, responses are improbable. This is based also on field trials. Generally the lower the figure the greater is the amount of potash that should be applied, but soil type and trials must at times be relied on to determine more exactly the amounts of potash needed.

Farmers have been struck by the efficiency of the service: First, from how well the figures fit the fertility and past treatment of fields, and, second, from the results secured from the recommended treatments. The Department is well aware of its responsibility in carrying out this service and analysis results are constantly checked with field trials.

Farmers may ask how often they should have their soils analysed. The ideal, of course, is to have an annual check, but this need not necessarily be done. Generally on most farms after the preliminary testing it is essential to retest from time to time those fields which have not responded.

It has been suggested that soil analysis is unnecessary and that observational field trials should take its place. They could if they were properly conducted and with experienced observers.

Very few farmers are able to do this and practically none on fields of medium fertility where the visual differences between treatments may be very small. When it is realised that on such fields an increase of 20 per cent. in growth in pasture is not readily observed by even experienced instructors in Agriculture it is apparent that incorrect conclusions are likely to be obtained by inexperienced persons. Such conclusions can be harmful to the farmer's pocket. On poor fields properly laid down trials can convey much information to farmers. Missing strips with the topdresser is another way of getting information. Generally farmers have not the time or inclination to lay down field trials and usually prefer to obtain the information by other

means. Soil analysis is a quick method of doing this.

Farmers sometimes inquire why soil analysis is not available for minor elements. It is for molybdenum, because there are sufficient field trials giving and not giving responses to molybdenum. This permitted agricultural chemists to determine satisfactorily the levels in the soil. They have even shown from trials the satisfactory levels for molybdenum under different pH values of the soil. Until there are sufficient response levels from field trials from other minor elements as satisfactory a service for these will not be possible.

Farmers puzzled about the fertility of fields should get in touch with the local instructor. Whether or not the soils are analysed can be determined on discussion. Instructors are not pushing farmers into taking the tests and will advise them to do so only where it will assist in solving their problems. So far it has proved to be an extremely useful guide to pasture topdressing.

A Movable Grinder Stand for Woolshed

THE grinder is usually set up as part of the fixed equipment of a woolshed and is too often allocated less valuable and therefore more poorly lighted space. The double-ended electric grinder illustrated is mounted on castors so that it can be pushed into the best light for the short periods it is used and wheeled well out of the way when not in use.

Good lighting is most important for making the thorough job of grinding combs and cutters which is essential for good shearing.

It is not always easy to place the fixed grinder in a handy position where good lighting is available on both discs of the double-ended grinder and where the grinder is not taking up space that could be better used.

Choice of position is limited with shafting plants, but lighting can often be provided by skylights, which give a good, diffused, even light. The movable grinder meets the problems of both light and space. Measurements of the stand are:—

Height from floor to top of stand is 3ft. (The measurement is usually 3ft. 6in. from floor to centre of spindle.)

The stand top is 2ft. 9in. long, 1ft. 7in. wide, and 1½in. thick.

The legs are 2ft. 6in. long and are of 2½in. x 2½in. timber. The top and bottom supports are of 2½in. x 1½in. timber. The legs are notched to let in these supports.

The bottom support is 10in. from the floor level.

The diagonal stays are of 4½in. x ¾in. timber.

The castors are 3in. diameter with a 1½in. tread.

The plates on the bottoms of the legs to which the castor frames are screwed are 5½in. x 4½in. x ¾in. thick.

The frame is bolted together, and as the grinder is perfectly balanced, there is no vibration.

The stand was built at the Department of Agriculture's Animal Research Station, Wallaceville.

—G. L. WICKENDEN, Sheep and Wool Instructor,
Department of Agriculture, Wellington

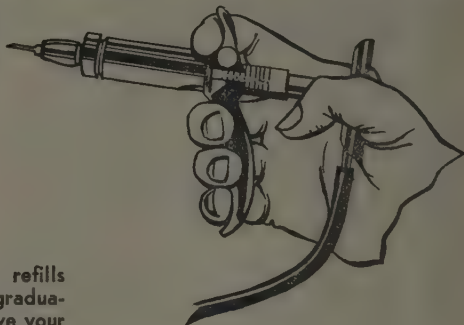


Be prepared for VACCINATION!

HERE IS **YOUR** BEST INSTRUMENT FOR MASS INJECTION AGAINST PULPY KIDNEY and BLACK LEG DISEASE . . .

Sayers AUTOMATIC VACCINATOR —

The Sayers Automatic Vaccinator doses accurately, refills automatically. It is adjustable from $\frac{1}{2}$ to 5 cc in $\frac{1}{2}$ cc graduations—the dose is visible in the barrel. Be sure you have your Sayers Automatic Vaccinator in time for use PRIOR to the lambing season.



— At all branches of . . .

Dalgety

AND COMPANY LIMITED
(Incorporated in England)

HYGIENE the first essential in **FOOD PACKAGING**

BATES MULTIWALL PAPER BAGS

*As Pure as the Windswept
Pines*



Virgin Pine from the sundrenched, windswept pumice lands, is converted at Kinleith into the stout Kraft paper for Bates Multiwall Paper Bags.

From the time the logs are pulped, until the Bags are delivered to the food packer, the interior paper walls are never touched by hand.

Kraft paper is impervious to seepage from inside and contamination from outside.

Bates Multiwall Paper Bags are hygienically perfect for bulk packaging of flour, sugar, milk-powder and all similar foodstuffs.

*Further particulars
from the Manufacturers:*

**N.Z. FOREST
PRODUCTS LTD.**

MULTIWALL BAG DIVISION,
PRIVATE BAG, AUCKLAND



Poisoning Wild Pigs with Arsenic Trioxide

By J. A. MILLER, Livestock Instructor, Department of Agriculture, Blenheim

WILD pigs kill young lambs and cause much pasture damage on farms in New Zealand. The total loss must be considerable, but it could be avoided if a systematic group poisoning programme were carried out by farmers. Though hunting with dogs and rifles has kept pigs in check over much of the country and the sport is enjoyed by men and youths, it has not given satisfactory control and many stout-hearted pig dogs have been ripped and disembowelled by old boars. The chasing has sent some pigs back to the heavy bush, fern, or scrub for a short time and the menace has not been lessened. Poison trials have been carried out recently in the Marlborough district with arsenic trioxide and meat and arsenic trioxide and apples. Results have been excellent and the farmers on whose properties the trials have been conducted are confident that an intensive poisoning campaign of all infested country would quickly eliminate the wild pigs.

ARSENIC trioxide is relatively cheap (about 2s. per pound), can be carried conveniently in a glass screw-top jar or well-sealed tin, and is very easily applied to any bait. As 2lb. of arsenic trioxide is sufficient to poison 16 sheep or goat carcasses or 8 horse carcasses, one man can easily carry sufficient poison with him into very rough country to lay an effective amount of bait in one day. Arsenic trioxide has the great advantage over phosphorus, another commonly used poison, that it is non-inflammable. This is particularly important in forest areas, and it is on the borders of these areas that most wild pig damage occurs.

Laying Poison Baits

Sheep, horse, or goat carcasses should be skinned near fresh rooting places or on pig tracks, the flesh being sliced open every 2in. along the carcass and the poison dusted into the cuts. A slice should be made through the belly wall, 2 heaped teaspoons of arsenic trioxide poured into the cavity,

and the poison well stirred around with the intestines. The flesh between the ribs should be sliced open and the poison dusted over lungs in the same manner.

It is advisable to stir the jar or tin of arsenic trioxide with a thin stick, but when this has been done the end of the stick with poison on it should be pushed well underground and broken off to prevent anyone else from picking it up and getting poison on his hands.

Approximately 2oz. of arsenic trioxide is sufficient to poison a goat or sheep carcass and 4oz. will be sufficient for a horse carcass.

Unpoisoned apples can be laid on pig tracks or rooting places for several days and after they have been eaten by the pigs, poisoned ones can be laid. The poison is applied by removing with a corer the centre from one side of the apple—not right through it—putting $\frac{1}{2}$ level teaspoon of arsenic trioxide into the hole, and replacing the wad of apple taken out by the corer. Baits are laid where required, but must not be used where there is any chance of people, particularly

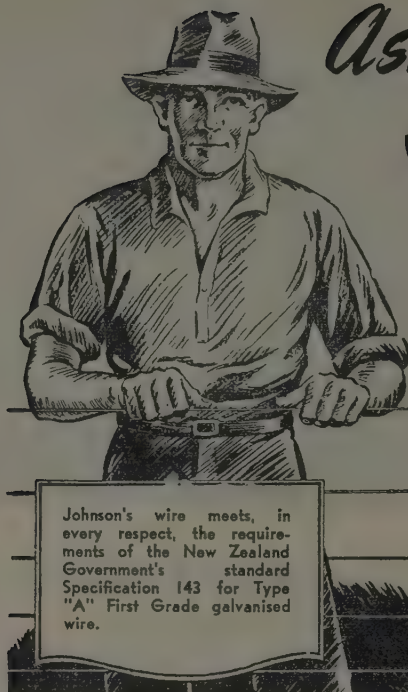
children, picking them up. The amount of poisoned apples laid will depend on the number of pigs in the area, but one poisoned apple will kill a pig.

Precautions

When meat is used as bait dogs should be kept away from the locality until bait is taken or all left-over baits have been buried. All uneaten poisoned carcasses and other baits should be buried when it is obvious that they cannot be taken by pigs, as this will reduce the risk of dogs being poisoned.

Arsenic trioxide should be used carefully and the powder should not be allowed to blow round when being applied to bait, as inhalation of the powder can cause illness or death. The powder should not be allowed to fall on the hands, especially if there are any abrasions on the skin; hands should be washed carefully after completion of poisoning operations and the poison should always be stored well away from children and labelled **POISON**.

A very intensive poisoning programme with arsenic trioxide can be carried out at little cost, and with co-operation among farmers on poisoning operations in pig-infested country the animals could be eliminated. The result would be better lambing percentages, better pastures, better fences, less work in combating the pest yearly, and higher returns from farming.



Ask for and insist on...

JOHNSON'S

PLAIN ENGLISH FENCING WIRE

STOCKS NOW AVAILABLE

At Stock and Station Agents and Hardware Merchants.
JOHNSON'S WIRE is made expressly to last — drawn with the skill of 150 years' experience from carefully chosen steel, protected by **PATENT**

HOT DIP GALVANISING the heavy coating of which ensures long life under New Zealand's climatic conditions. It is practically immune from the corrosive action of salt-laden air, whereas inferior, thinly galvanised wire needs constant renewing. Johnson's wire is durable and will save you costly repairs, renewals and re-erectations.

**WHEN YOU ORDER FENCING WIRE
INSIST ON JOHNSON'S**

**RICHARD JOHNSON
& NEPHEW LTD.**

MANCHESTER, ENGLAND.

Sole N.Z. Agents:—

JOSEPH NATHAN & CO. (N.Z.) LTD.

P.O. Box 1792, Wellington
P.O. Box 949, Auckland
P.O. Box 1604, Christchurch

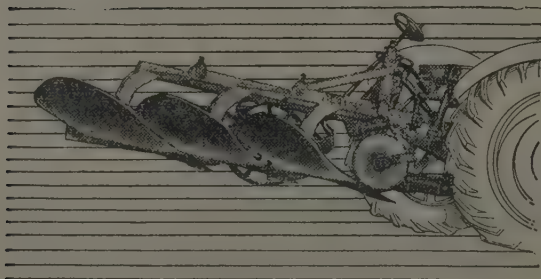
Rolling Downs . . . or in the Rough . . .

THERE'S A

REID & GRAY MOUNTED PLOUGH

FOR EVERY PURPOSE!

Whatever the type of land you farm—there's a Reid & Gray mounted plough to suit your requirements. And whichever one you choose, you can be confident that it is the best of its kind—built specially for New Zealand conditions by skilled craftsmen using the finest materials. Reid & Gray can also supply other famous farm machinery.



Illustrated: Reid & Gray 3-furrow General Purpose Mounted Plough (convertible to double furrow).

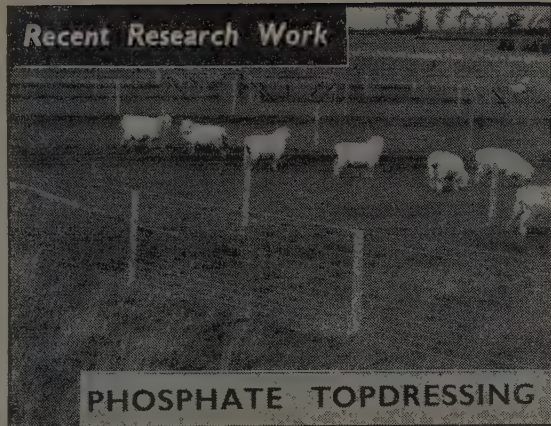
Head Office and Works: BURNSIDE, OTAGO.

Branches at Invercargill, Gore and Balclutha

Agents—Auckland: Alfred Buckland & Sons Ltd.; Hamilton: Newton King Ltd.; Gisborne: Tractor & Machinery Co. Ltd.; Palmerston North: Reid & Gray Agency Co. Ltd.; New Plymouth: J. B. MacEwan & Co. Ltd.; Masterton and Nelson: Levin and Co. Ltd.; Blenheim: E. Cresswell & Sons Ltd.; Greymouth: Greymouth Motors Ltd.; Christchurch, Ashburton, Timaru, Waimate and Oamaru: National Mortgage & Agency Co. of N.Z. Ltd.

REID & GRAY LTD.

Recent Research Work



PHOSPHATE TOPDRESSING

MUCH interest has been taken recently in investigation into the most efficient rate of phosphatic topdressing for grassland. Optimum rates will naturally vary with soil type and prior treatment and the following notes give the interim results from a trial at the Winchmore Irrigation Research Station designed to investigate what annual superphosphate dressings are necessary to maintain a high level of pasture production under irrigation.

TREATMENTS AND MANAGEMENT

THE trial area, on Lismore shallow silt loam, is divided into 20 small fields, each of which constitutes a plot and consists of a single irrigation "check" of approximately $\frac{1}{4}$ acre. There are five superphosphate treatments, each replicated four times. The annual rates of application of superphosphate per acre are: Nil (control), $1\frac{1}{2}$ cwt., 3 cwt., and $4\frac{1}{2}$ cwt., all applied in autumn, and 3 cwt., half of which is applied in autumn and half in spring. In addition each plot is divided longitudinally into 2 lime sub-plots, "no lime" and "lime to requirements".

The trial is irrigated as required, results of soil moisture determinations being used as a basis. Pasture production is measured by the frame technique. Grazing of the trial is aimed primarily at maintaining even and adequate control of growth. To avoid possible transference of fertility in the dung and urine each treatment is grazed by a separate flock, which grazes in rotation the four replications of the treatment only. Control of pasture growth is maintained by the addition or removal of sheep. The sheep are tagged, shorn, and weighed before introduction to the trial and weighed regularly thereafter.

When the trial was laid down the 2-year-old pasture was perennial ryegrass-white clover dominant, with dogstail prominent in spring and cocksfoot and Montgomery red clover in autumn. Timothy and short-rotation ryegrass, which had been included in the mixture, were seldom seen in the sward. The area had been ploughed out of browntop pasture in June 1948 and had received 2 tons of lime and 3 cwt. of superphosphate in the 3 years before the start of the trial. Soil tests taken before the first topdressing showed a pH of 6.2 and a phosphate level of 4 to 4.5 (low to medium on this soil type). In May 1952 the first of the annual superphosphate dressings was applied. In addition 3 cwt. of limestone was applied to the lime sub-plots in both 1952 and 1953. Grazing began in September 1952 and continued until May 1953. In the next season stocking began in September and the last sheep were removed at the end of April 1954. Except during the flush each spring, control and utilisation of the growth have been good. Stock health on all treatments has been excellent, though some scouring occurs in spring. Most of

the sheep (2-tooth wethers) are fat when removed from the trial.

INTERIM PRODUCTION DATA

second year.

Production data for the first two seasons are given in the table. In dry matter production all superphosphate treatments gave large increases over no superphosphate. This response was slightly greater in the

RELATIVE PASTURE AND LIVESTOCK PRODUCTION (No Superphosphate = 100)

Superphosphate	Pasture production (dry matter) per acre		Liveweight gains per acre		Grazing days per acre	
	1952-53	1953-54	1952-53	1953-54	1952-53	1953-54
Nil	100	100	100	100	100	100
$1\frac{1}{2}$ cwt.	145	158	130	132	137	153
3 cwt.	158	169	137	135	136	179
$4\frac{1}{2}$ cwt.	157	172	127*	146	135*	194
$1\frac{1}{2}$ cwt. in spring	155	181	136	157	137	166
$1\frac{1}{2}$ cwt. in autumn						

(No superphosphate = 100)

Agreement between pasture production and livestock figures is quite good, but sheep numbers are probably too small for much importance to be attached to the stock figures. When the results are being considered it must be remembered that the pH and phosphate levels of the area when the trial began were higher than those found on undeveloped land.

—S. D. WALKER

MINOR ELEMENTS

BY the middle of this year about 200 new observational trials will be under way to secure information on pasture requirements of sulphur, magnesium, boron, copper, zinc, vanadium, and manganese applied singly and in combination.

The following pasture responses to minor elements have already been obtained in current experiments.

Sulphur—Sulphur responses were secured as early as 1928 on lucerne in Central Otago. Pasture responses to sulphur, however, were observed first about 3 years ago on the "tarry" soils (Waiareka complex) of North Otago. Since then marked responses to sulphur and various sulphates have been obtained on several soils in Canterbury and on Tarawera gravel in Bay of Plenty.

Boron—Despite the general occurrence of the deficiency disease brown heart in swedes and turnips pasture topdressing trials so far have failed to demonstrate clear boron responses on pasture.

Magnesium—Magnesium has been tried extensively in various forms. A serpentine rock finely ground was used in some 30 trials without conclusive results at the beginning of the Second World War. In more recent trials a response to magnesium carbonate was recorded on Ketu silt loam in the Marlborough Sounds and on Pinaki sand north of Auckland.

Copper—Cunningham observed a growth response of pasture on a peat soil at Waitakaruru, where he successfully demonstrated copper deficiency in cattle and sheep. During the last 2 years experiments on pastures have indicated that several important soils derived from wind-blown sand and pipe clay gumland soils north of Auckland as well as peat soils may require copper for maximum pasture production.

Zinc—Zinc responses on pasture have been observed in two instances on relatively raw coastal sand and a fleeting response to zinc was recorded on a peaty pumice soil near Te Aroha.

Sodium—The application of sodium chloride (salt) may be of value on some potash deficient soils, particularly in the Bay of Plenty.

Responses have been recorded to vanadium in the Kaitia district, Northland, to tungsten at Outram, south of Dunedin, and to nickel in a pasture mowing trial near Gore.

—C. DURING

HEADING PHOTOGRAPH: The phosphate trial area at Winchmore.

Scientific proof that Phenzeen Plus gives Maximum Kill

Scientific tests were recently carried out by the Commonwealth Scientific and Industrial Research Organisation in Australia to determine how fine the phenothiazine particles must be for greatest effect.

Elliotts Fine Particle Phenothiazine, as used in Phenzeen Plus, was proved to have the correct sized particles necessary for MAXIMUM KILL.

Elliotts manufacture their own raw material and are thus always able to ensure fine particle phenothiazine of correct particle size for maximum effectiveness.

Elliotts were the Pioneers of Liquid Phenothiazine Drenching

Elliotts NEW



GREEN BAND

PHENZEEN PLUS

WITH
CORRECT PARTICLE SIZE PHENOTHIAZINE

MANUFACTURED IN NEW ZEALAND BY ELLIOTTS N.Z. COMPANY: ELLCO LTD., AUCKLAND. 11.4C



LARGE
PARTICLE
PHENOTHIAZINE



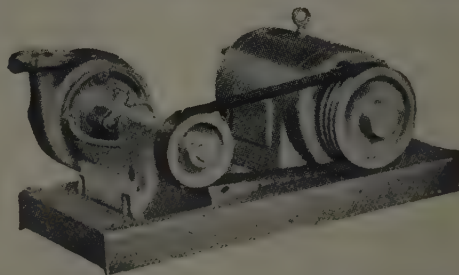
FINE
PARTICLE
PHENOTHIAZINE



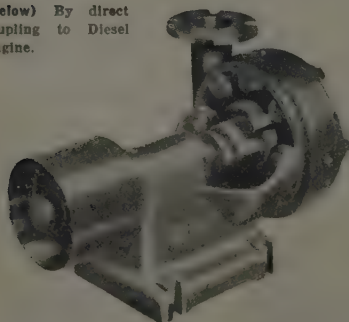
A DEPENDABLE ★ ECONOMICAL ★ PROVEN PUMP FOR

LOW COST

WATER SUPPLY
IRRIGATION
SPRAYING etc.



(Below) By direct coupling to Diesel Engine.



Let the HARLAND solve your water problems at lowest cost—a thoroughly reliable single stage pump, the HARLAND "monoglide" requires little skill in installation and ensures exceptionally low maintenance costs—it is ideally suited for every kind of duty involving the movement of fluids at low heads.

HARLAND

MONOGLIDE

Single Stage
CENTRIFUGAL PUMPS

Full information from

JOHN CHAMBERS & SON LTD.

Can be arranged to be driven by: Tractor Power Take-off, Petrol Engine, Diesel Engine, Electric Motor, etc.

AUCKLAND and at WELLINGTON, CHRISTCHURCH, DUNEDIN, INVERCARGILL, WHANGAREI, HAMILTON, GISBORNE, HASTINGS, NEW PLYMOUTH, PALMERSTON NORTH, NELSON, ASHBURTON, TIMARU, OAMARU.

Hormone Control of Nodding Thistle

NODDING or musk thistle (*Carduus nutans*) has become a serious weed in many parts of Canterbury. Because of its rapid spread the Ashburton County Council declared it to be a noxious weed many years ago. In this article W. A. McKellar, Fields Instructor, Department of Agriculture, Ashburton, discusses the weed's habits and suggests methods of control. The plant is a biennial, similar to and often confused with the Scotch or spear thistle (*Cirsium lanceolatum*). It is often wrongly called star thistle. It strikes readily from seed and during its first year forms a rosette of large, spiny, dark green leaves up to 18in. in diameter. Plant food is stored in a large, deep taproot, from which one or more seed heads up to 6ft. high appear during the following spring.

THE flowers are bright crimson to purple and are surrounded by strong spines. The flower head is usually larger than that of the Scotch thistle and grows upright while it is developing, but it droops later, and it is this habit that gives this plant its name.

Occurrence

Nodding thistle grows on all types of land from heavy arable to the very light and even appears in shingly riverbeds. The plant naturally grows more strongly on high-fertility land, and under these conditions the rosette of leaves formed in the first year smothers out pasture growth in a circle up to 18in. in diameter. In addition, stock avoid grazing close to this circle of spiny leaves. The loss of grazing in a paddock may appear small to the farmer concerned, but the reduced grazing caused by these thistles over the whole of the Ashburton County, for example, is responsible for a considerable loss in production.

Control

Until recently the only methods of control were fallowing to kill the young seedlings as they germinated or topping pastures as the seed heads appeared from the rosette in the second year of the thistle's life. The latter method did not prevent the smothering of the pasture while the thistle was in the rosette or first-year stage. The bare ground left in the

pasture after mowing allowed further thistle seeds to strike with a resultant heavier infestation than the original one.

With the advent of hormone weedicides it is now possible to control thistles by spraying. Of the two most suitable hormones for use when spraying thistles in pasture, the water-based salts of M.C.P. are preferable to those of 2,4-D, as they damage the white clover least, except in young

pastures. In a young pasture water-based 2,4-D preparations should be employed at $\frac{1}{2}$ lb. acid equivalent per acre.

The thistles are most susceptible to hormones in the seedling stage, when $\frac{1}{2}$ lb. acid equivalent per acre of M.C.P. or 2,4-D should give excellent control. Where rosettes have formed and seed heads are appearing from the crown, the pasture should be grazed short to bare the leaves to obtain maximum spray coverage. The hormone should be applied at up to 1lb. acid equivalent per acre in this instance. For best results spraying should be done in spring (early October) when fine weather is likely to follow for 1 to 2 days after the application.

Method of Application

The accompanying photographs illustrate the excellent results obtained on a thistle-infested pasture near Ashburton. Approximately one-third of its area was covered in thistles from the seedling stage up to 2ft. high. On the advice of an officer of the Department of Agriculture the farmer fitted a low-volume sprayer to his tractor, with a 45-gallon drum to hold the spray. The paddock was sprayed on a hot, calm day in October, with 1lb.



A nodding thistle plant grows well on medium land and produces much seed.



Nodding thistle on this pasture has been controlled by the use of a 14ft. spray boom. The remaining strips show the density of the thistle before treatment.



A complete kill of thistles was obtained on the strip of pasture in the centre of the photograph. The dense patch of thistles on the left was not sprayed.

of M.C.P. in 11 gallons of water per acre. Some difficulty was experienced in obtaining a complete coverage of the paddock, as there was no marker fitted to the tractor. In addition, an allowance was made for a certain amount of spray drift which did not take place through absence of wind.

Little change in the thistles was apparent in the first week, but shortly afterward necrosis in the veins of the fleshy leaves and twisting of the flower stalks showed that the hormone was killing the plants slowly and surely. The photographs show the almost complete kill of thistles in the 14ft. widths covered by the spray

boom. The 1ft. to 2ft. strips unsprayed show how thick the thistles were in the paddock before spraying.

Conclusion

Nodding thistles produce large quantities of seed, and prevention of seeding should be the aim of every farmer. Where seed is present in the soil it should be followed through the summer to germinate these seeds for later destruction. Seedlings appearing in crops or pastures tolerant to hormones, such as cereals or potatoes, can be killed with water-based salts of M.C.P. or 2,4-D, preferably M.C.P., as it causes least damage to most crops. Care should be exercised when pastures containing white clover are being sprayed. White clover seedlings are particularly sensitive to hormones, and the use of M.C.P. should be confined to mature clover plants at a rate not exceeding 1lb. acid equivalent per acre. A good dense turf will prevent thistle seedlings from appearing. The following recommendations are therefore offered as a guide:—

1. The use of adequate lime and superphosphate.
2. The efficient use of D.D.T. for grass-grub and porina (*Oryctes*) control.
3. The removal of headed grass-seed straw.
4. The avoidance of pugging of pastures in wet weather.
5. An application of superphosphate after spraying to strengthen the pasture and assist regrowth of pastures on the bare patches left by the dying thistles.

Radio Broadcasts to Farmers

RADIO broadcasts to farmers will be given during June as follows:—

1XN Hamilton

13 June (12.33 p.m.)—"The Feeding of Calves", by D. W. Caldwell, Veterinarian, Department of Agriculture, Hamilton.

20 June (12.33 p.m.)—"Drainage", by H. McM. Bull, Instructor in Agriculture, Department of Agriculture, Hamilton.

24 June (8.10 p.m.)—"Current Farming Problems", by panel of speakers.

27 June (12.33 p.m.)—"Lambing on Hill Country", by A. W. Moore, Federated Farmers.

1YZ Rotorua, 7.15 p.m.

9 June—"Siting and Layout of Dairy Premises", by L. E. Downs, Special Inspector, Department of Agriculture, Hamilton.

23 June—"Planting and Initial Pruning of Young Fruit Trees", by H. A. Prew, Horticultural Instructor, Department of Agriculture, Tauranga.

2ZA Palmerston North, 12.33 p.m.

6 June—"Tuberculosis in Pigs", by N. E. Downey, Veterinarian, Levin.

13 June—"Planning Hill Country Improvement", by W. J. Burns, Instructor in Agriculture, Department of Agriculture, Dannevirke.

20 June—"Preparations at the Milking Shed for the New Season", by H. A. Du Fresno, Farm Dairy Instructor, Department of Agriculture, Palmerston North.

27 June—Y.F.C. session, by I. G. Tabor.

2XA Wanganui, 8 p.m.

2 June—"For the Countrywoman", by Mary Macdonald.

9 June—"The Radio Vet.", by S. Jamieson, Veterinarian, Department of Agriculture, Wanganui.

16 June—"Some Common Dangers to Farm Stock", by J. F. Munting, Livestock Instructor, Department of Agriculture, Wanganui.

23 June—"Chick Rearing", by B. J. Russell, Poultry Instructor, Department of Agriculture, Wanganui.

30 June—"Dairy Shed Hygiene", by G. M. Cooper, Westmere Y.F.C.

4YA Dunedin, 9.15 p.m.

6 June—"Tomato Growing under Glass", by W. G. Crawford, Horticultural Instructor, Department of Agriculture, Oamaru, and a grower.

13 June—"Seed Production Trials", by G. A. Holmes, Superintendent, Invermay Research Station, Mosgiel.

20 June—"Pasture Species and Pasture Establishment", by N. A. Cullen, Research Officer, Invermay Research Station, and S. M. J. Stockhill, Fields Instructor, Department of Agriculture, Dunedin.

27 June—"Developments in Farm Machinery", by L. W. Weston, Machinery Instructor, Department of Agriculture, Dunedin.

4YZ Invercargill, 7 p.m.

7 June—"Forming a Young Farmers' Club", by L. Reid, Fields Instructor, Department of Agriculture, Gore.

14 June—"Young Farmers' Club's First Meeting", by L. Reid.

21 June—"Young Farmers' Club Programme", by L. Reid.

28 June—"Hoggets", by R. Buchan, Livestock Instructor, Department of Agriculture, Gore.

Regular Sessions

1XN Hamilton, Mondays at 12.33 p.m. and Tuesdays at 8 p.m. (Frankton stock market report), Wednesdays at 12.33 p.m. (report from Ruakura Animal Research Station), Thursdays

at 12.33 p.m., Fridays at 8 p.m. (stock sale review).

1XN Whangarei, Mondays at 8.5 p.m., Wednesdays at 8.1 p.m. (Northland stock market report), Fridays at 8.1 p.m.

1YZ Rotorua, Mondays at 12.33 p.m. (Waikato stock market review), Tuesdays at 7 p.m. (Hamilton stock market report), Wednesdays at 7.15 p.m. (Pig Council talk on fourth Wednesday of every other month), Thursdays at 12.33 p.m. and 7.15 p.m. (fortnightly).

2XA Wanganui, Wednesdays at 8 p.m. (Wanganui stock sale report), Thursdays at 8 p.m.

2XG Gisborne, Tuesdays at 8 p.m., Fridays at 8.2 p.m. (Gisborne stock market report).

2XN Nelson, Thursdays at 8 p.m.

2XP New Plymouth, Thursdays at 8.1 p.m.

2YA Wellington, Mondays at 7.15 p.m., Thursdays at 12.33 p.m., Fridays at 7 p.m. (Fielding stock market report).

2YZ Napier, Tuesdays at 12.12 p.m. (Hawkes Bay orchardist session), Tuesdays at 7.10 p.m., Wednesdays at 7.15 p.m. (Hawkes Bay-Poverty Bay livestock market report), Thursdays at 12.33 p.m.

2ZA Palmerston North, Mondays at 12.33 p.m., Fridays at 8.45 p.m. (Fielding stock market report).

3XC Timaru, Mondays at 8 p.m. (Pleasant Point stock market report), Tuesdays (fortnightly) at 8 p.m. (Temuka stock market report), Wednesdays at 8 p.m., and Saturdays at 10.30 a.m.

3YA Christchurch, Mondays at 12.20 p.m., Wednesdays at 7.15 p.m. (Addington stock market report), Thursdays at 12.33 p.m. and 7.15 p.m.

3YZ Greymouth, Thursdays at 12.33 p.m.

4YA Dunedin, Mondays at 12.33 p.m., Wednesdays at 7 p.m. (Burnside stock market report), Thursdays at 12.33 p.m.

4YZ Invercargill, Mondays at 12.33 p.m., Tuesdays at 7 p.m.

Trees and Shrubs for Coastal Gardens

THE seaside garden is one of the most difficult to develop. It is often exposed to strong, salt-laden winds and the usually sandy soil makes it difficult to establish trees and shrubs. In this article K. H. Marcussen, Horticulturist, Department of Agriculture, Christchurch, outlines how such a garden can be developed and discusses some of the trees and shrubs that are most tolerant of coastal conditions. The section on flower garden work for June is by M. Joanna Lockie, Horticultural Instructor, Department of Agriculture, Auckland.

WHEN a section near the beach is taken over it may be found to consist of almost pure sand partly covered with marram grass. This may at first seem satisfactory if the property is to be used only for weekends and summer holidays, but it will soon be found to be both too hot and too exposed if some shelter is not provided. Even a few trees or shrubs will give sufficient shelter and shade for comfort and also increase the capital value of the property.

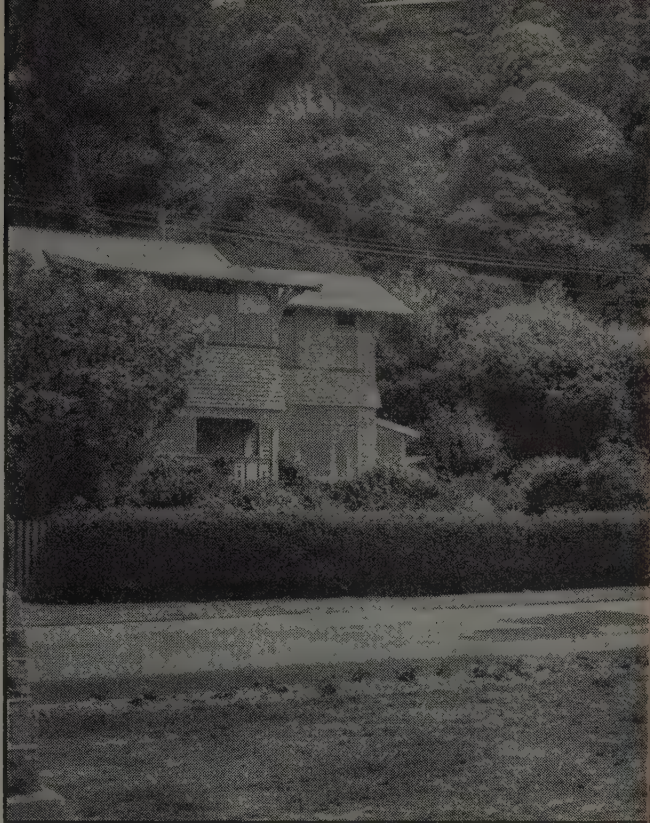
The Sandy Section

The first consideration for a garden on a sandy section is to bring the soil to a state where plants can survive without much difficulty. This can be brought about either by bringing soil into the garden from an outside source or by improving it by growing green crops and turning them in. Probably a combination of these two methods is the most satisfactory if development of the garden has to be kept at a reasonable cost.

If a section is well covered with marram grass, it will be profitable to turn it in. This is best done with a rotary hoe, as the marram grass then becomes thoroughly mixed in to the depth of operation.

The section should at this time also be roughly levelled off according to the desired layout. Whether this should be done before or after the rotary hoeing depends on the amount of levelling to be carried out.

Blue lupins should then be sown at a rate of not less than ½ oz. to the square yard. It is important to get a quick cover to prevent the sand from shifting. A dressing of



A coastal garden can be most pleasing when well planted with trees and shrubs.

2oz. of superphosphate to the square yard at the time of sowing will assist the lupins to become established. An important function of the lupins is that they are able to obtain nitrogen from the atmosphere. When the lupins have been dug in this nitrogen will be made available to other plants through the breakdown taking place during decomposition.

Subsequent turning in of green crops will improve the humus content of the soil. This can be accelerated by bringing other organic material into the soil. Anything that normally is placed in the compost heap can be dug directly into the sandy section, and provided that adequate soil moisture is available, it will soon rot. Straw or old stack bottom would also be valuable.

The importance of the humus content of a sandy soil cannot be stressed too much, as apart from the nutrient provided to plants, humus will bind the sand particles together and assist in conserving moisture which would otherwise drain away very quickly.

Importance of Shelter

There are many plants that will tolerate strong winds and salt-laden atmosphere when they are established, but for newly planted trees and shrubs it is of the greatest importance that shelter is provided or evaporation from the leaves may take place at a greater rate than the plant is able to take up water through the roots.

Hedges should therefore be given priority when planning the development of a seaside garden, and it may be advisable to provide artificial shelter for a newly planted hedge for the first few years. This can be done by erecting a temporary wire fence on the windward side and clothing it with scrim, branches of manuka, macrocarpa, or similar materials.



Pittosporum crassifolium is one of the best plants for coastal hedges.

TRIUMPH SPREADS IT THIN

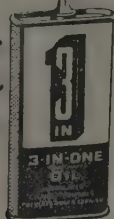
MUNRO TRIUMPH TOPDRESSER will mix and sow lime and fertiliser and other ingredients at the low quantity of 1 cwt. per acre if desired. Mixes and sows any quantity wished, up to 3 tons per acre. Also sows seeds. 14ft. spread attached trailer or truck at 10 miles an hour, an acre covered in 3½ minutes. £66/15/- on trucks Invercargill: Freight N.I. rail/air £4/10/- to £5/10/-; less by boat. Initial depreciation, 30% (£20/0/6) as well as ordinary 7½% allowed off taxation. Immediate Delivery if you act at once.

FREE Booklet! Full description and Instructions available by writing:

J. M. McCROSTIE,
P.O. Box 67,
Invercargill.

ANTI-RUST

Includes
special
agent



Gives
complete
protection

Fight rust . . . and win! Greater penetrating power and "oiliness" make "3-in-One" Oil the ideal ANTI-RUST lubricant for the home, office, workshop and garage. BETTER protection—better value—buy "3-in-One" Oil today.

B5-1

VACANCIES

Department of Agriculture
at centres throughout
New Zealand

- Male or Female Clerks
- Clerical Assistants
- Shorthand Typists

Salaries are on improved Public Service scale

Superannuation and generous leave

For further particulars please write to:—

STAFF CLERK

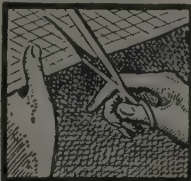
Department of Agriculture,
P.O. Box 2298,
Wellington

WINDOLITE

Supersedes Glass
*it's better in 6 ways—
and cheaper!*



NO MORE BREAKAGES!
Windolite is strong as steel. No expense or trouble replacing.



CUT WITH SCISSORS. Measure with diamonds—or trough—ordering the right size. You cut it with scissors.



FIXED WITH HAMMER AND NAILS. No puttying. Just tack Windolite into place.

Windolite is a lightweight, unbreakable, glass substitute. It is a transparent plastic sheet, reinforced with galvanised wire mesh. It has enormous strength.

Windolite is normally nailed in place—no putty required! Windolite admits health-giving Ultra-violet Rays of sunlight vital to growth, which ordinary glass shuts out! Windolite resists the passage of heat or cold. Keeps buildings cooler in summer and has shown fuel economies of up to 25% in winter! Completely weatherproof! It's easy and quick to fit. Make your own windows and lights in COWSHEDS, BARNs, POULTRY HOUSES, etc.



Seedlings grow big and strong in less time.



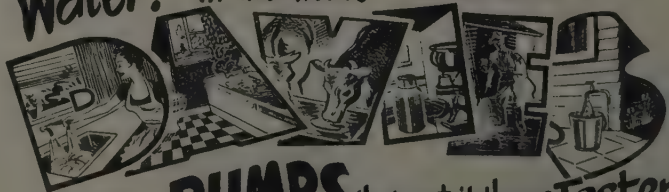
**SOLD FROM THE
ROLL 36" WIDE.
Available ANY
LENGTH—**

**FROM Seedsmen
and Hardware
MERCHANTS.**

WRITE NOW

- To Dept. "J", D. & O. Agencies Ltd., P.O. Box 2396, Auckland, for your FREE Booklets—"21 ways it can help you" and "Make it yourself with Windolite".

Water! in the home... on the farm ...



make the **PUMPS** that get it there Faster

For the home, DAVIES have designed the superb 250 G.P.H. 15 gallon pressure tank model. Automatically operated it supplies bathroom, kitchen and laundry needs with wonderful efficiency.

DAVIES have a large range of water, milk, farm pumps, indispensable to the happy running of the modern farm. Remember—DAVIES make the pumps to suit the purpose.

Automatic & Self Oiling —

D. H. DAVIES & CO. LTD.

404 Broadway, Newmarket, Auckland. Phone 26-049 Business; 87-261 after hours.
MANUFACTURERS OF MILK PUMPS, DEEP WELL GEARINGS, PRESSURE OUTFITS

Even after a hedge has been established it may be necessary to shelter individual trees and shrubs after planting. This can be done either by erecting a screen of sacking on the windward side of the plant or by placing 3 or 4 branches of macrocarpa as a tripod over it. Such a tripod will break the wind and shade the plant adequately without coddling it excessively.

Planting and After-care

The general improvement of the soil by incorporation of green crops and compost may not give quick enough results for the successful establishment of trees and shrubs. It may therefore be decided to bring some soil in to improve the soil just where these plants are to be placed. A fairly heavy loam would be preferable, but it should be in good heart and contain plenty of humus. Even a few shovelfuls placed around the roots of a tree at planting time would prove beneficial.

So far consideration has been given only to the sandy section, but in many coastal places there are banks of a clayey nature. Planting trees and shrubs on these banks may mean a great deal of preparation, as the soil may often be found to be very firmly compacted. Holes for planting may have to be dug out with pick and shovel and it may also be necessary in such positions to incorporate good soil.

A warning should be given against the creation of a pit for planting a tree



Above—Feijoa as an informal hedge.
Left—*Euonymus japonica aurea* as a specimen.



or shrub. If it is found necessary to dig out a pit in a position where water does not run freely, adequate drainage must be provided; otherwise rain-water will collect in the pit and may kill the plant.

If preparation of the site for planting has been attended to previously, the planting itself is easily done.

Planting at the seaside should always be done during autumn or early winter to enable the plants to develop new roots before the dry periods which are often experienced during late spring and summer.

Small but vigorous plants should be chosen, as they establish themselves much better than larger ones; "soft" plants should be avoided. The plants should be handled with great care so that the roots are disturbed as little as possible, and the roots must not be allowed to dry out during planting. Any damaged or excessively long roots should be trimmed back with a clean cut and all roots should be spread out well in the planting hole before being covered. They should be very well firmed and watered in.

In most areas it will be advisable to support the young plants. This can be done either by tying them securely to a stout stake driven well into the ground alongside, or for squat-growing



TAUPATA

Trees and Shrubs for Coastal Gardens



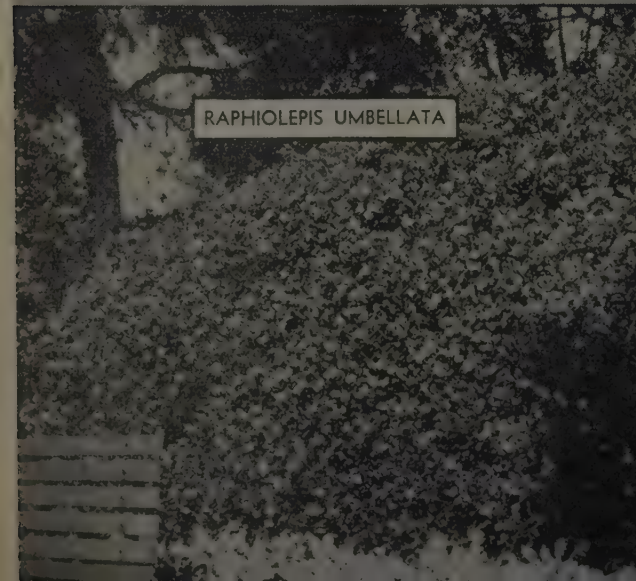
PINK DIOSMA



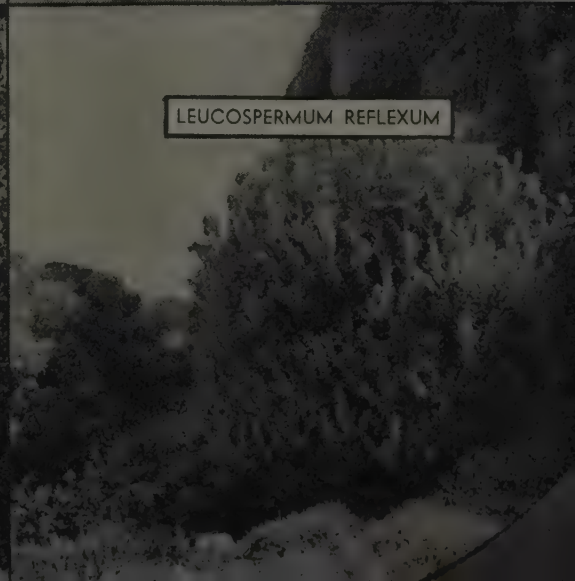
TASMANIAN NGAIO



TAMARISK



RAPHIOLEPIS UMBELLATA



LEUCOSPERMUM REFLEXUM

subjects by placing stones around them close to the stems.

Watering must be attended to when required until the plants are growing well. No definite directions can be given for this, as conditions vary from year to year, even in the same district.

A mulch should be applied as soon as the weather gets warm. This may consist of any organic material such as half-rotted compost, stack bottom, grass cuttings, etc., and should be placed over an area radiating a couple of feet from the plant without being in direct contact with the stem itself, as it may then soften the bark, which can cause entry of fungous or bacterial diseases. The main functions of the mulch are to minimise evaporation of soil moisture and keep the soil cooler. By the activities of soil organisms the mulching material will gradually be incorporated into the soil and should be added to when required.

In sandy gardens a further benefit will be obtained by growing green crops among newly planted trees and shrubs, as additional shelter will be given to the permanent plants. Nothing, however, should be allowed to compete for soil moisture within 2ft. or 3ft. of a newly planted tree or shrub.

Pruning and training of seaside trees and shrubs, especially hedges, should be done early to develop strong and stocky plants.

Selection of Hedges

Hedges are formed by shrubs and small trees that will tolerate frequent cutting back, but all these plants will develop into their natural types if left growing as specimens. The plants that are suitable for growing as hedges will consequently also be valuable as specimens in the seaside garden, where hardness is of prime importance.

It may even be desirable to grow hedges more as ornamental shelter belts around the section if the seaside garden is to be used mainly as the family health resort. A brief description of the natural habit of growth is therefore given of the plants suggested for use in hedges.

One of the finest hedge plants is the native karo (*Pittosporum crassifolium*). It is rather slow growing, but forms a splendid firm hedge with dark green foliage (see the illustration on page 517). If left untrimmed, it will grow into a small tree. It has small purple flowers followed by seed capsules which open and show the black seed.

Another native plant which makes a good hedge is *Corokia cotoneaster*. It is very hardy and perhaps more favoured in southern districts. The foliage is greyish-green. Naturally it will grow into a bush some 6ft. high and the small red fruits will then be a feature.

A plant which should be grown much more in coastal gardens is *Euonymus japonica aurea*, the golden

spindleberry. It is an evergreen and can be used as a hedge, a specimen tree, or shrub; it is possible to prune it for any position, as it breaks freely, even where old branches are cut. The illustration on page 519 shows a plant growing as a small shrubby tree.

The Tasmanian ngaio (*Myoporum serratum*) is more robust than the native species and can be recommended. It is quick growing and care should be taken not to leave it untrimmed while young, as it will then be difficult to get bottom cover in the hedge. The Tasmanian ngaio grows to a considerable size if left untrimmed, as can be seen in the illustration on page 520. It is a good shade tree and will grow in almost pure sand. In areas which experience heavy frosts it should not be planted out until late spring. Once established it will stand colder temperatures without being killed out.

The native taupata (*Coprosma baueri*) is very useful for hedges, but like the ngaio it will not tolerate much frost. The light green foliage with shiny surface gives it the name the looking glass plant. The natural habit is for sprawling growth, as can be seen in the illustration on page 520, where a plant originally was trained as a tree but later left to grow naturally.

There is a variegated variety which is less vigorous, but it is more frost tender and can be recommended only for northern districts.

For general use the English holly (*Ilex aquifolium*) will probably be considered too slow growing, but it makes an excellent hedge. There are several variegated varieties which can be planted with advantage in the sea-side garden.

Escallonia provides a number of species that are useful both in hedges and as specimen shrubs.

One of the plants considered most frequently for the coastal garden is tamarisk (*Tamarix gallica*) and other species. They are extremely hardy and grow easily from hardwood cuttings, but cannot be considered good hedge plants; the foliage is very fine and deciduous, which makes it unsuitable. As specimen plants they are graceful with the light plumes of pink flowers. The habit can be seen in the illustration on page 520. The evergreen athel tree (*Tamarix aphylla*) is not considered tolerant of severe coastal conditions.

For an informal hedge in northern districts the feijoa is very useful. (See illustration on page 519.) It is tolerant of salt-laden winds and most attractive during summer when the red,



A young pohutukawa in full flower.



**TRUCK
OPERATOR'S EXPERIENCE**
*"Ford Batteries
stand up best to the
heavy drain from
commercial work."*



Six types, 9 to 15
plates. From Ford
Dealers, leading
garages and service
stations.

**THE POWER PLUS BATTERIES
FOR EVERY MAKE OF CAR,
TRUCK, TRACTOR**

FORD MOTOR COMPANY OF
NEW ZEALAND LIMITED LOWER HUTT

251.9

**KEEP
FIRE
OUT**

LINE ALL
INTERIOR WALLS
AND CEILINGS WITH
FIRE-RESISTANT
**GIBRALTAR
BOARD**

FIRE-SAFE
WALLBOARD

Since

1872

THE
NATIONAL BANK
OF NEW ZEALAND
LIMITED

The many branches
of the National Bank
throughout New
Zealand have offered
a service of exper-
ienced financial
counsel to farmer
customers.

134 Branches and Agencies throughout New Zealand.

MBT 34

gum-like flowers are showing; the fruit, which ripens during winter, is an advantage.

Rosemary (*Rosmarinus officinalis*) is also suitable for an informal hedge, though smaller than the feijoa, and it can be trimmed. It will grow 4ft. to 5ft. high and forms a compact screen; if it is left untrimmed, the light purple flowers appear from late winter onward. Its fragrant foliage is well liked by womenfolk.

For a small dividing hedge *Correa alba* is most useful. It has pale green foliage and small white tubular flowers. If left untrimmed, it grows some 4ft. high.

Suitable Shrubs

The native broadleaf (*Griselinia littoralis*) is very hardy and can be classed as a shelter plant. It is grown for its bright green foliage and forms a dense shrub 8ft. or higher. It will stand trimming.

Another native grown for its foliage is the akeake (*Dodonaea viscosa*). It is not as tolerant of salt spray as the broadleaf, but if given some shelter, it will stand up to coastal conditions. There are two types, one purple and one with pale green leaves. They are rather loose in structure and grow some 8ft. to 10ft. high. The purple-leaved variety is useful for bringing colour into the garden.

The senecios are also well known in coastal gardens. Perhaps the most popular is *Senecio greyi* with small grey leaves and yellow daisy-like flowers in summer. Of the natives probably the hardiest for coastal conditions is *Olearia traversi*, which will grow in pure sand in the most exposed position, making a bushy tree up to 15ft. high.

The veronicas or hebes should not be forgotten among the native plants.



The karaka makes a good shade tree and can be trained as a standard.

Varieties are available from nurseries, and most of them do well near the sea. They form fairly compact shrubs with terminal panicles of small flowers.

Of the deciduous shrubs the buddleias are among the best. Even small plants carry large panicles of scented flowers, which are mostly in pink and mauve. They grow quickly, reaching a height of 8ft. or 10ft., but should be pruned fairly hard during winter to

encourage vigorous flower shoots. There is also an evergreen species (*Buddleia salviifolia*) which flowers in winter.

The Australian bottlebrush (*Callistemon*) will stand seaside conditions fairly well and is always showy when in flower. It will stand very dry conditions. To keep the bush compact the flowers should be pruned off when spent; otherwise the plant becomes very straggly.

Another Australian shrub of value in the seaside garden is *Grevillea rosmarinifolia*, a fairly dense plant growing up to 6ft. high. The flowers are not very showy, but are unusual, giving the plant the name snail flower. There are several other shrubby species which all do well near the sea.

The Indian hawthorn (*Raphiolepis umbellata*), which by the way is not thorny, is very slow growing, but forms a compact shrub with a large spread, as can be seen in the illustration on page 520. It has dark green leathery leaves and white flowers followed by black berries.

Other suitable berried shrubs are pyracantha and cotoneaster.

For northern districts *Nerium oleander* does well. There are a number of varieties available with single and double flowers; most are in pink and red shades. Not so well known are the podalyrias; the smaller one, *P. sericea*, known as the satin bush, has silvery leaves and pale pink flowers and is very showy even though it is only 3ft. to 4ft. high. *P. calypttrata* grows up to 8ft. high and has greyish-



A mature specimen of the evergreen oak.

**BUY THE
LARGE
SIZE
AND
Save Money**

●
**FOR CERTAIN SUCCESS
USE
EDMONDS**

Famous for 4 Generations

Products of

T. J. EDMONDS LTD., CHRISTCHURCH

EDMONDS *You Save*
Sure-to-rise
Baking Powder *1/2*

5 lb. tin 13/7

... and get a handy
tin for biscuits!

EDMONDS *You Save*
Sure-to-please
Custard *up to 1/1*

4 lb. tin 8/11

... and get a handy
container!

EDMONDS

**FINEST MAIZE
Cornflour**

The 1/7½ full-pound
packet gives you

*more for
your money*

The prices shown above are for main centres.

25



*"They say—
NEW ZEALAND
Depends on me"*

I know what I depend on. The Bank of New Zealand. You see, the B.N.Z. has been established in my town for a good many years and it's worth a great deal to me to have advice based on local conditions. It's mighty comforting too, to know that I have the facilities and the "know how" of our country's largest bank behind me.



Bank of New Zealand

At the service of
primary industry
since 1861

50C

green foliage and pale purple flowers in late winter.

The lantanas are also confined to districts without much frost. Flowering will begin when the shrubs are quite small and continues for a long period each year. There are a number of varieties with different coloured flowers and their habits vary: *L. selowiana* has a trailing tendency and will sprawl over rocks.

Another plant requiring a sunny position is the cistus or rock rose. It is hardy and will give a profusion of flowers. There are several varieties in various colours growing from 2ft. to 5ft. high.

The true breath of heaven, *Diosma ericoides*, is not grown as much as it deserves. The fine foliage is very aromatic and the small white flowers open up earlier in spring than the pink *diosma*, *Coleonema pulchrum*, illustrated on page 520, which is better known, but not fragrant. Both should be trimmed back after flowering so that a compact structure will develop; otherwise strong winds may spoil the bushes when they are a few years old.

Spanish broom (*Spartium junceum*) is well known for its long flowering period. It should be kept open by pruning and allowed to develop a free structure, or the flowers will develop only on the top of the plant.

Californian lilac (ceanothus) provides many delightful shrubs that are

moderately tolerant to salty conditions. They vary in height up to 12ft.; most have flowers in blue shades.

An unusual shrub is *Leucospermum reflexum* with grey foliage and orange-red protea-like flowers. In southern districts it demands a warm position and should always be planted in full sun in a very well-drained soil. The illustration on page 520 shows a specimen growing near Christchurch. It is quick growing and within a few years after planting several hundred flowers may be showing at once.

Suitable Trees

The Norfolk Island pine (*Araucaria excelsa*) is as popular for coastal planting as is the tamarisk. For the large area it certainly has a place, but it should not be planted in a small garden. The rat-tails, as the branchlets are often called, will play havoc with the spouting on buildings near by. It is frost tender, especially when young, and will survive only in the warmest parts of the South Island.

Lagunaria patersoni, the Norfolk Island hibiscus, is more hardy and should survive in favoured positions in the south. It is a tree of lovely shape (see the illustration on this page), fast growing, and reaching a height of 25ft. or more. The pink flowers are similar to hibiscus and make up for their smallness by their abundance during the flowering season in midsummer. The trees begin flowering very early; in fact they can sometimes be seen flowering in nurseries before being planted out in their permanent positions.

Among the natives the pohutukawa (*Metrosideros tomentosa*), illustrated on page 521, ranks very high. It abounds on North Island shores, but as it is frost tender, it will grow in only a few places in the south. The red flowers are rather short lived, but glorious while they last. The pohutukawa will stand trimming and makes an excellent hedge in the north. There is now also a yellow variety available.

The Kermadec Islands pohutukawa (*M. villosa*) is also suitable for coastal planting. It flowers most of the year, but not at any time with a great quantity of blooms; the flowers are red. It is generally seen as a smaller tree than the native species, though in time it will outgrow it. Unfortunately this tree is also frost tender, especially while young.

The karaka (*Corynocarpus laevigata*) is a useful tree, giving both shelter and shade, but again it is not hardy and is mainly recommended for the North Island. It has large, dark green leaves and the orange coloured fruits are an added attraction in autumn. The pulp of the fruit is eatable, but the seeds themselves are poisonous. A small specimen tree is shown on page 523.

Yet another small native tree, *Pseudopanax lessoni*, the five-fingered



The Norfolk Island hibiscus is a very shapely tree.

lancewood, is useful for the seaside garden. It forms a small shrubby tree some 10ft. high and is valued for its dark green foliage.

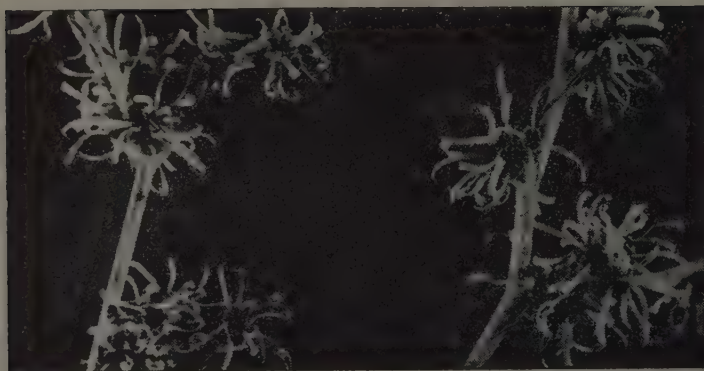
Among the exotic trees the evergreen oak (*Quercus ilex*) ranks high for coastal planting. It is useful both as a tree and as a hedge, but the beauty of the dark green leaves is often lost through the ravages of a leaf miner. The illustration on page 523 shows a mature tree.

The Irish strawberry tree (*Arbutus unedo*) will tolerate coastal conditions fairly well and forms a lovely small tree some 15ft. to 20ft. high. The evergreen foliage is dark green and the small creamy white flowers, which are followed by strawberry-like fruits, make it still more attractive.

Several of the gums will grow near the sea, but for beauty none is equal to the scarlet flowering *Eucalyptus ficifolia*, which is quite hardy to salty winds, though tender to frost, especially while young. Rather slow growing, it will eventually reach a height of some 25ft. It has a broad head, which will have a mass of flowers during the warmest part of summer. The winter flowering *E. leucorhylon*



A casuarina growing on the beach at Timaru.



Witch hazel (*Hamamelis mollis*) is one of the few shrubs which flower in mid-winter. [Elliott]

var. *rosea*, which is more tolerant to frost, can be seen in coastal areas right to the far south. It is pink flowered, but both these gums are raised from seed and great variation in colour occurs.

The pincushion flower (*Hakea laurina*) is often mistaken for a gum. It has become very popular and is well worth growing, as the unusual flowers are carried in winter. Being of rather loose structure and growing only some 8ft. to 10ft. high, it can almost be classed as a large shrub.

The she-oak (*casuarina*) is another Australian tree providing a good subject for the coastal garden. In the illustration on page 525 is shown a young tree trained as a standard at Timaru. If left natural, the rush-like branches would extend to the ground.

Flower Garden in June



During June garden cultivation should be governed by the condition of the soil. As long as soil is well drained and fit to work it may still be cultivated and new beds prepared, but very wet soil cannot be worked up satisfactorily.

Shrubs

Planting of hardy deciduous shrubs may be carried out now if weather and soil conditions are favourable. If conditions are not right when the shrubs arrive, the plants should be heeled in in a sheltered part of the garden until the soil is drier. Where shrubs are planted in wet soil they do not require as much firming in as those planted in drier soil. If the soil is wet, the firming in can be completed later when the soil is a little drier. To protect shrubs from wind rocking they should be staked at planting.

Lack of attention to firming the soil about plant roots is one of the chief causes of failure with new shrubs. After heavy frost newly planted shrubs should be inspected to make sure they have not been lifted and that their roots are not exposed and left to dry out.

When balled shrubs are being planted, that is, shrubs with their roots done up in a ball of earth and sacking, the sacking should be removed and the roots straightened before planting.

Roses

Rose planting can be carried out now if soil conditions are suitable. New bushes received from the nursery will not have been pruned, and should be pruned to shape when they are planted or in cooler districts left until the normal pruning season.

Pruning of established roses should not be done yet. It is better to wait



Iris unguicularis. [Elliott]

until August or even later in southern districts, as early side shoots induced by pruning may be frosted and the bush suffer a severe setback.

Foliage Plants

Plants having grey foliage are attractive at all seasons, but especially in winter, when there is little of interest in the garden. Easily grown silver-leaf plants are *Anthemis tinctoria*, *Cerastium*, lavender, *Santolina chamaecyparissus*, *Senecio greyi*, and *Centaurea candidissima*. All these plants can be increased by division or by cuttings. Golden or yellow foliage plants are equally bright and useful in winter. Golden euonymus and golden privet can both be raised easily from cuttings taken now and next month.

Flowers for Cutting

Most gardeners try to have a daphne bush for winter flowers, and flowers can be cut freely and heavily without harming the bush. If flowers are cut freely, little further pruning is necessary.

Two other shrubs flowering now are winter sweet (*Chimonanthus praecox*) and witch hazel (*Hamamelis mollis*), and both of them can be picked hard for their flowers. Cut each branch or twig with the secateurs, making a clean cut above a bud. Care should be taken to avoid spoiling the shape of the shrub by cutting out important branches when collecting cut flowers. Twigs or branches of these shrubs last well in water for over a week, but the scent gradually fades.

Two herbaceous plants invaluable for flowers at this time are *Iris unguicularis* (stylosa) and *Helleborus* (winter rose or hellebore). Though the lavender flowers of *Iris unguicularis* look too dainty to stand winter conditions, they are hardy and flower well; one established clump provides ample flowers. Flower buds and stems are frequently attacked by slugs, and to be sure of getting undamaged flowers it is best to gather the buds before the petals open. Rather than cutting and getting short-stemmed flowers, the gardener should hold the stem near the basal sheath and pull firmly. The bud should slip out with about 1½ in. longer stem. The hellebore is also invaluable for winter flowers. Old-established plants flower generously. Propagation may be by division, but new plants are difficult to establish. Seedlings are easier to grow, but there may be flower-colour variations. If they are planted in a cool, shady spot, their foliage is neat and attractive and their pink or cream flowers, though not showy, are useful for cutting.

Hellebore flowers should not be cut while too immature, as they will not keep in water. Once the petals or rather sepals firm up the flowers last better, but to make sure they do not wilt the flower heads and stems should be soaked in water before they are arranged.

A Winter Sports Outfit with Contrasting Motifs

THE winter sports outfit illustrated is equally suitable for skating, skiing, or any other outdoor winter activity. It consists of a roll collar jersey, mittens coming well over the wrists, and hood buttoned under the chin. The main colour is red and the contrasting colour is white, but these may be varied to meet individual tastes.

ABBREVIATIONS: K., knit; p., purl; st., stitch(es); tog., together; rem., remaining; rep., repeat; beg., beginning; inc., increase; dec., decrease; sl., slip; p.s.s.o., pass slipped stitch over; Mn., main; C., contrast; st.st., stocking stitch (1 row k., 1 row p.); in., inches; cont., continue.

Materials: 22oz. of 4-ply wool in main colour (red); 6oz. of the same wool in a contrasting colour (white); 1 pair each of No. 9, No. 10, and No. 12 knitting needles; 4 No. 9 and 4 No. 12 knitting needles, with points at both ends. A button for hood.

Finished Measurements

Jersey: Length, 23in.; bust, 37in.; sleeve seam, 18in. Hood: Round face, 16in. Mittens: Length of hand, 7in. All round hand, 7in. Tension: $6\frac{1}{2}$ st. to 1in. on No. 9 needles; 7 st. to 1in. on No. 10 needles.

The Jersey Back

With 2 No. 12 knitting needles and Mn. wool, cast on 99 st. and work 1in. in k. 1, p. 1 rib. Cont. in st.st. until work measures 7in., then change to No. 9 needles, and inc. 1 st. at each end of next and every following 6th row until there are 119 st. Now cont. straight in st.st. until work measures 15 $\frac{1}{2}$ in., ending with a p. row.

Shaping Armholes

Cast off 5 st. at beg. of next 2 rows, then dec. 1 st. at each end of every row until 97 st. remain. Cont. straight until work measures 20 $\frac{1}{2}$ in., ending with a p. row.

Next row: K. 1, C., * 2 Mn., 1 C. Rep. from * to end. Break off Mn. wool and cont. in st.st. with C. only until work measures 23in., ending with a p. row.

Shaping Neck and Shoulders

Next row: K. 62 st.; now slip the last 27 st. just knitted on to a spare needle, k. to end. Cont. in st.st. on last set of 35 st. only thus:—

1st row: Cast off 7 st., work to last 2 st., work 2 tog. 2nd row: Work 2 tog., work to end.

Rep. these 2 rows twice more. Cast off. With wrong side of work facing rejoin C. wool to remaining 35 st., work to end. Now complete as given for first side.

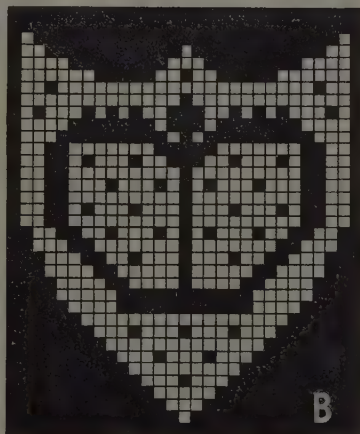
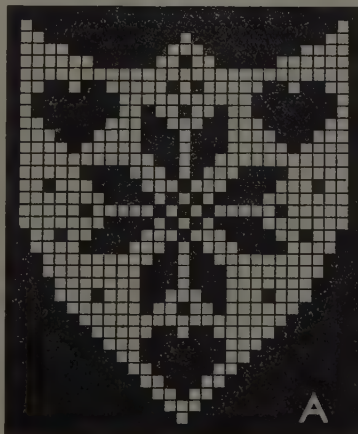
Front

Follow instructions given for back until work measures 15 $\frac{1}{2}$ in., ending with a p. row. Three motifs are worked across front of jersey—motif from chart B at centre and one motif from chart A on either side of it. B motif has only 32 rows.

Shaping armholes and working festive motifs: Work first 16 rows with a separate ball of C. for each motif.



The completed outfit.



528—WINTER SPORTS OUTFIT . . .

Do not weave in wool not being used, but strand loosely across back of work.

1st row: Cast off 5 st., k. 23 Mn. (including st. already on right hand needle) k. 1, with 1st ball of C., k. 30 Mn., k. 1, with 2nd ball of C., k. 28 Mn.

2nd row: Cast off 5 st., p. 22 Mn., (3 C., 28 Mn.) twice, 3 C., 22 Mn.

3rd row: K. 2 tog., k. 19 Mn., 2 C., 1 Mn., 2 C., 26 Mn., 5 C., 26 Mn., 2 C., 1 Mn., 2 C., 19 Mn., k. 2 tog., Mn.

4th row: P. 2 tog., p. 17 Mn., 2 C., 3 Mn., 2 C., 24 Mn., 3 C., 1 Mn., 2 C., 24 Mn., 2 C., 3 Mn., 2 C., 17 Mn., p. 2 tog., Mn.

5th row: K. 2 tog., k. 15 Mn., 2 C., 5 Mn., 2 C., 22 Mn., 9 C., 22 Mn., 2 C., 5 Mn., 2 C., 15 Mn., k. 2 tog., Mn.

6th row: P. 2 tog., p. 13 Mn., 2 C., 7 Mn., 2 C., 20 Mn., (3 C., 1 Mn.) twice, 3 C., 20 Mn., 2 C., 7 Mn., 2 C., 13 Mn., p. 2 tog., Mn.

7th row: K. 2 tog., k. 11 Mn., 3 C., 7 Mn., 3 C., 18 Mn., 13 C., 18 Mn., 3 C., 7 Mn., 3 C., 11 Mn., k. 2 tog., Mn.

8th row: P. 2 tog., p. 9 Mn., 5 C., 2 Mn., 1 C., 2 Mn., 5 C., 16 Mn., (3 C., 1 Mn.) 3 times, 3 C., 16 Mn., 5 C., 2 Mn., 1 C., 2 Mn., 5 C., 9 Mn., p. 2 tog., Mn. (97 st.).

This completes armhole shaping. Cont. thus, working through motif charts, keeping 4 st. each end of rows in Mn. colour and gradually working extra st. into motif so that when the 16th row has been worked there are only 4 st. between each motif. When this point has been reached break off 2 balls of C., and cont. with 1 ball each of Mn. and C. across all st. until 33rd row of charts has been completed. Work 3 rows in st.st. with Mn.

Next row: K. 1 C., * 2 Mn., 1 C. Rep. from * to end.

Break off Mn. wool and cont. in st.st. with C. only until work measures 2½ in., ending with a p. row.

Shaping neck: Next row: K. 55 st., slip the last 13 st. just knitted on to a spare needle, k. to end. Cont. in st.st. on this last set of 42 st., dec. 1 st. at neck edge of every row until 29 st. remain. Cont. straight until work measures 2½ in., ending at armhole edge.

Shaping shoulder: 1st row: Cast off 7, work to end.

2nd row: Work to end.

Rep. these 2 rows twice more. Cast off. With wrong side of work facing, rejoin C. wool to remaining 42 st. and work as given for first side.

Sleeves

With 2 No. 12 needles and Mn. wool cast on 54 st. and work 2 in. in k. 1, p. 1 rib. Change to No. 9 needles and cont. in st.st., inc. 1 st. at each end of 7th row and of every following 8th row until there are 82 st. Cont. straight until work measures 18 in., ending with a p. row.

Shaping top: Cont. in st.st., dec. 1 st. at each end of every alternate row until 60 st. remain, then dec. 1 st. at each end of every row until 32 st. remain. Cast off 4 st. at beg. of next 6 rows. Cast off.

Collar

Join shoulder seams. With right side of work facing, using 4 No. 12

needles with points both ends and C. wool, beg. at left shoulder seam and pick up and k. 32 st. evenly down one side of front neck, k. 13 st. from spare needle, pick up and k. 32 st. along other side of neck, 8 st. along back of neck, k. 27 st. from spare needle, k. up 8 st. along other side of back neck. Arrange these 120 st. evenly on 3 needles and work 2 in. in k. 1, p. 1 rib. Change to No. 9 needles and work a further 3 in. in rib. Cast off loosely.

Hood

With 2 No. 10 needles and C. wool, cast on 10 st. and work thus:—

1st row: K. to end.

2nd row: Cast on 10 st., p. to end.

3rd row: K. 2 tog., k. to end.

Rep. the 2nd and 3rd rows once, and then the 2nd row once again.

Cont. in st.st., dec. 1 st. at beg. of next and every alternate row until 35 st. remain.

Next row: P. to end.

Cont. in st.st., inc. 1 st. at end of next row and of every following 6th row until there are 42 st. Cont. straight until work measures 6 in., ending with a p. row. Dec. 1 st. at end of next row and every alternate row until 32 st. remain.

Next row: P. to end.

Next row: Cast off 10 st., k. to last 2 st., k. 2 tog.

Rep. last 2 rows once. P. 1 row. Cast off. Work a second piece in same way, but reversing shapings by working k. row for p. row and p. row for k. row.

Centre Piece

With 2 No. 10 needles and Mn. wool, cast on 22 st. and work 9½ in. in st.st., ending with a p. row. Cont. in st.st., dec. 1 st. at each end of next row and every following 8th row until 14 st. remain. Cont. straight until work measures 12½ in., ending with a p. row. Cast off.

Front Border

Join side pieces to centre piece, with cast-off edge of centre piece at last sets of 10 cast-on st. of side pieces and with cast-on edge of centre piece at straight front edge of side pieces. With 2 No. 12 needles and Mn. wool, with right side of work facing, k. up 148 st. evenly round front edge. Work ½ in. in k. 1, p. 1 rib. Cast off fairly loosely in rib.

Neck Border

With 2 No. 12 needles and Mn. wool cast on 122 st. and work ½ in. in k. 1, p. 1 rib. Now make a buttonhole thus:—

Next row: Rib 4, cast off 4, rib to end.

Next row: Rib to last 4 st., cast on 4, rib to end. Cont. in rib until work measures 1½ in. Cast off in rib.

Right-hand Mitten

With No. 10 needles and Mn. wool, cast on 70 st. and work ½ in. in k. 1, p. 1 rib. Now work 4 rows in st.st., beg. with a k. row. Cont. in st.st., working 1 motif from chart B on back of gauntlet, i.e., the beg. of k. rows and at the end of p. rows, beg. with 32nd row and ending with 1st row. Thus the first 4 rows will be as follows:—

1st row: K. 4 Mn., 1 C., 25 Mn., 1 C., 39 Mn.

2nd row: P. 39 Mn., 2 C., 11 Mn., 1 C., 11 Mn., 2 C., 4 Mn.

3rd row: K. 4 Mn., 4 C., 8 Mn., 3 C., 8 Mn., 4 C., 39 Mn.

4th row: P. 39 Mn., 6 C., 5 Mn., 2 C., 1 Mn., 2 C., 5 Mn., 6 C., 4 Mn. Cont. thus, working through chart until 1st row has been completed. Break off C. wool and cont. with Mn. only. Work 4 rows in st.st., thus ending with a p. row.

Next row: K. 2, * k. 2 tog., k. 1. Rep. from * to last 2 st., k. 2. (48 st.)

Change to No. 12 needles and work 1 in. in k. 1, p. 1 rib. Change to No. 10 needles and work 2½ in. in st.st., ending with a p. row.

Shaping thumb: Next row: K. 32, slip the last 8 st. just worked on to a safety pin for thumb, k. 16.

Next row: P. 16, cast on 8, p. 24. Cont. straight until work measures 6 in. from end of wrist ribbing, ending with a p. row.

Shaping top: 1st row: (K. 1, sl. 1, k. 1, p.s.s.o., k. 18, k. 2 tog., k. 1) twice.

2nd row: P. to end.

3rd row: (K. 1, sl. 1, k. 1, p.s.s.o., k. 16, k. 2 tog., k. 1) twice.

4th row: P. to end.

5th row: (K. 1, sl. 1, k. 1, p.s.s.o., k. 14, k. 2 tog., k. 1) twice. Cont. thus, dec. 4 st. every alternate row until 20 st. remain, ending with a k. row.

Next row: P. 10.

Place 2 sets of 10 st. tog. and graft.

Thumb

Slip the 8 st. from a safety pin on to a No. 10 needle and with Mn. wool work 2½ in. in st.st., ending with a p. row.

Shaping top: 1st row: K. 2 tog., * k. 1, k. 2 tog. Rep. from * to end.

2nd row: P. to end.

3rd row: K. 1 (k. 2 tog.), twice.

Break wool, thread end through rem. st., draw up and fasten off. With No. 10 needles and Mn. wool, pick up and k. 8 st. from cast-on st. at top edge of thumb. Work to match first side.

Left-hand Mitten

Follow instructions given for right-hand mitten to thumb shaping, but work motif at end of k. rows and beg. of p. rows. Thus the first 2 rows of motif will be as follows:—

1st row: K. 39 Mn., 1 C., 25 Mn., 1 C., 4 Mn.

2nd row: P. 4 Mn., 2 C., 11 Mn., 1 C., 11 Mn., 2 C., 39 Mn.

Shaping for thumb: Next row: K. 24, slip the last 8 st. just knitted on to a safety pin and leave for thumb, k. 24.

Next row: P. 24, cast on 8, p. 16 (48 st.). Complete hand and thumb as given for right-hand mitten.

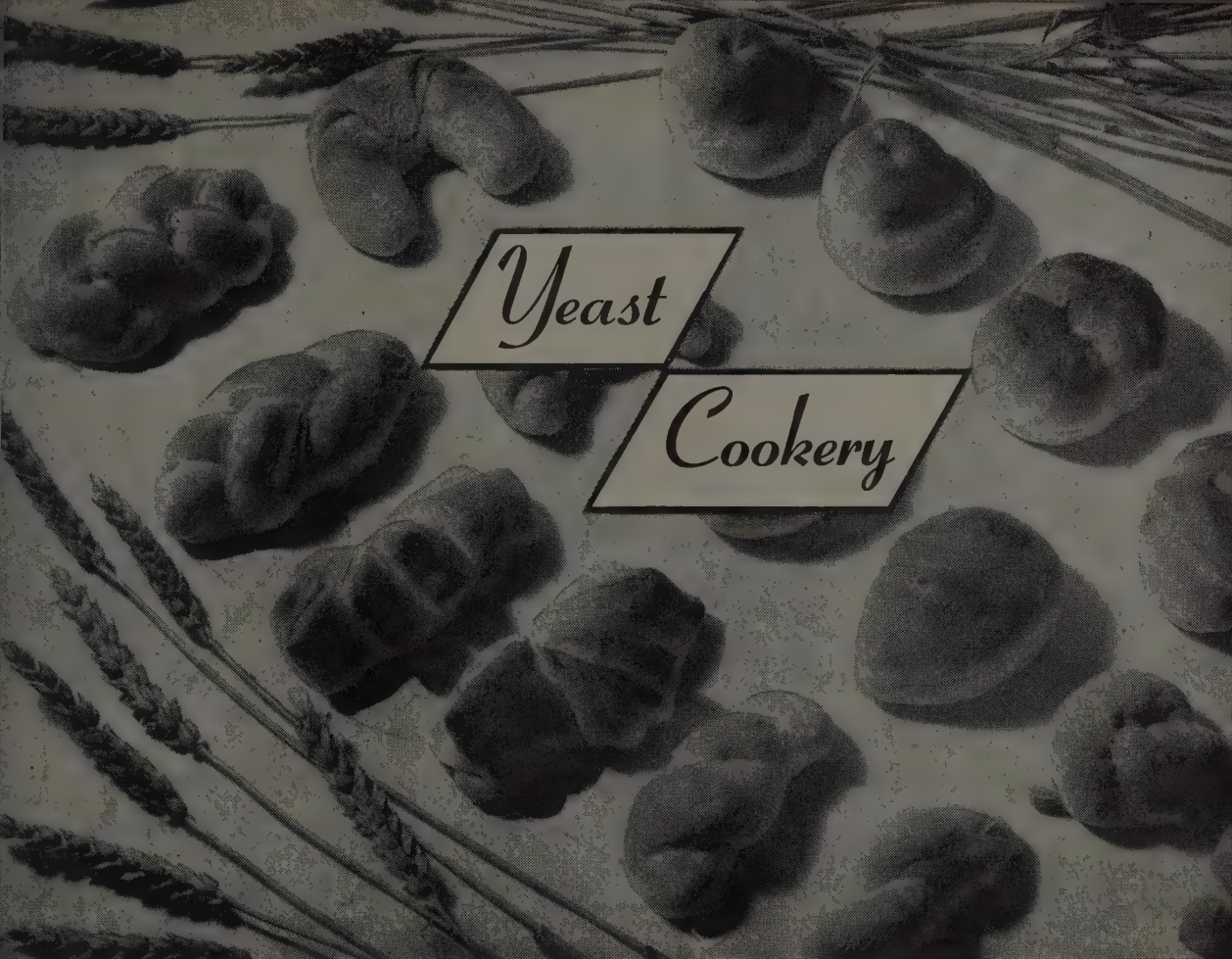
Make-up

Press all work with a damp cloth and a hot iron.

Jersey: Join side and sleeve seams. Set in sleeves and sew with a back-stitch seam. Press seams.

Hood: Make 2 small pleats at neck edge of each side piece and secure. Sew on neck border with buttonhole to right-hand side leaving 1½ in. of border free at each end. Sew on button. Press seams.

Mitten: Join seams at side of hand and each side of thumb. Press seams.



Yeast

Cookery

By DAPHNE EILERS, Field Officer in Rural Sociology, Department of Agriculture, Auckland

NOTHING could be more pleasant on a cold winter's morning than to walk into a warm kitchen and be met by the sweet, nutty smell of freshly baked bread. It is a pleasure not often experienced today. With the wider distribution of commercial bakery products, fewer and fewer housewives bake their own bread. Many are not aware of the exciting possibilities which yeast offers in a wide variety of recipes, quite apart from plain loaves and rolls. Foods in which yeast acts as the raising agent may be used in almost any part of the day's menu.

YEAST can be bought in a dry state or in packet form. Fresh compressed yeast should be pale and moist. Dark patches and drying show the yeast to be stale and some of the cells will be dead. Home-made liquid yeast is quite satisfactory, but unless the housewife intends to use it regularly, it is simpler and more convenient to use the packet yeast. Dried yeast must be activated by soaking in a little lukewarm water for about 20 minutes before it will begin fermentation.

Yeast is made up of many tiny living cells. Given a temperature of 80 to 85 degrees F., moisture, and food in the form of a little sugar, the cells begin to multiply. They break down

some of the starch, producing sugar, alcohol, and carbon dioxide. The gas is distributed through the dough and causes it to become light and to rise. It is important to note that the action of yeast is checked by freezing, and that any temperature over 180 degrees F. will kill it altogether, so care should be taken that, in all stages before the actual cooking, the mixture is kept at a constant lukewarm temperature. The fact that the yeast cells are retarded in their growth by freezing is helpful, as bread dough can be stored in a refrigerator for a week or more and used as it is needed.

The quantity of yeast needed to leaven a mixture varies with the type of flour used, the richness of the recipe

(fats slow up the action of the yeast), and the method of mixing. Wholemeal flours require more yeast than white flours. A little extra yeast may be added to speed up the rising if time is limited, but it is wiser to adhere strictly to the recipe whenever possible.

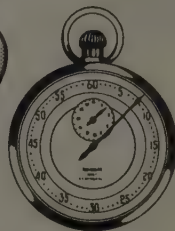
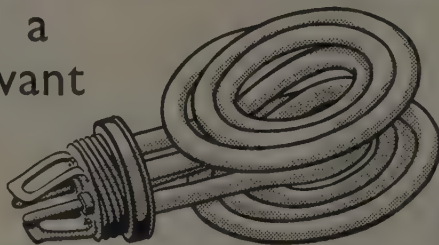
It is important not to skip any of the steps outlined in the method. Milk should always be scalded before use; otherwise it may turn sour due to the warmth necessary for the rising and proving period. In order to maintain the lukewarm temperature throughout it is necessary to warm not only the liquid, but also the dry ingredients and the basin in which the mixture is to be made.

Yeast mixtures fall mainly into two groups, doughs and sponges. To ensure even distribution of the gas bubbles in doughs it is necessary to knead them thoroughly, taking care to keep the mixture warm during this operation.

Speed-Speed-Speedee!

When you want a cup of tea, you want it—fast!

Speedee



All records broken for fast water boiling

DOUBLE X JUG ELEMENT

(Patent applied for)
(Provisional Patent No. 111149)

FIT IT YOURSELF—You can do it in a few minutes.

If you cannot secure a Speedee Double X Jug Element write to H. C. Urlwin Ltd., Waltham Road, giving your dealer's name.

GET
YOURS
NOW
PRICE

21/-

Your Speedee Double X has two elements in one. It's the fastest known way to boil water. And if one element goes, the other carries on.

The Speedee Double X Jug Element is a further development of H. C. Urlwin Ltd., the originators of the Tubular Jug Element for faster boiling.

4 YEARS' GUARANTEE

H. C. URLWIN LTD.

Waltham, Christchurch.

EXTRA FEATURES AT NO EXTRA COST!



Easyway WASHING MACHINES

STOCKISTS THROUGHOUT N.Z.

Manufactured by
SPEEDWAY PRODUCTS LTD.,

26 ALBERT STREET, AUCKLAND

For Comfortable Winter Travel

.... GO BY TRAIN!



You'll enjoy the relaxation—the freedom from travel strain and worry—when you go by train or railcar! All long-distance trains are steam-heated during the winter months.

For the observance on Monday, June 6, of our Queen's Birthday—as for the school holidays between May 7 and May 22—regular express trains and railcars will be supplemented by extra services arranged to suit your convenience.



Consult your nearest railway booking office for full information.

Convenient, Economical Travel

NEW ZEALAND RAILWAYS

Kneading is working the dough lightly with the knuckles, and folding it over. It is important to use only sufficient flour to prevent the dough from sticking to the board. If too much flour is used, it is worked into the dough and makes the resulting product dry and tough.

In the case of sponges where there are two periods of rising the mixture must be beaten well at the end of the first rising. If, however, there is only one rising, care must be taken to blend the mixture well before setting it to rise; otherwise the texture of the finished product will be poor with large irregular holes scattered throughout.

The rising time varies according to the amount of yeast used and when the mixture has doubled in bulk the next step should be started immediately. If the mixture is allowed to rise any further, the resultant product is likely to have a sour taste; also there may be too great an escape of gas and the mixture will collapse when placed in the hot oven. On the other hand it is a poor baker who does not allow the mixture to rise completely. Products of such cookery will be hard and tough through lack of gas. When the mixture is set to rise in a warm place it should be covered with a clean cloth, and then a blanket placed over it or a wooden board put on top of the cloth. This keeps the cold air away from the bowl and prevents the mixture drying excessively on the surface.

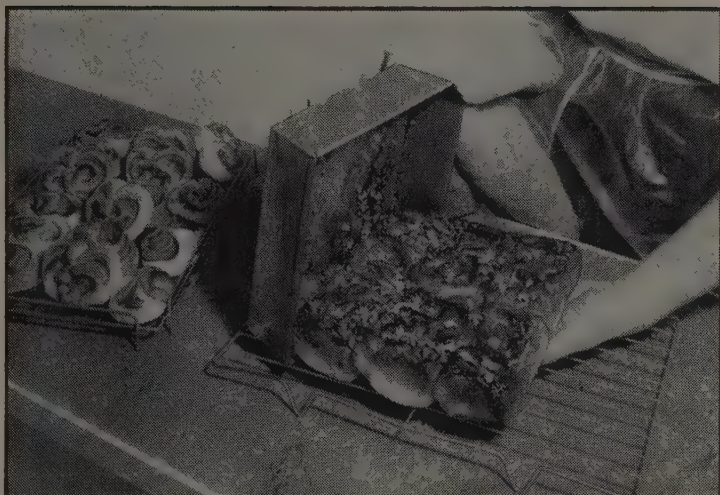
Variations of Standard Rolls

All these rolls are made from the same basic mixture and are suitable for serving at breakfast, luncheons, or with morning coffee. They make a welcome change for packed lunches and certainly save time taken in making sandwiches. Stale rolls can be recrisped by dipping in milk or water and placing in a preheated oven for a few minutes. Small rolls make an excellent base for savoury mixtures for party-supper snacks.

Standard Recipe for Bread Rolls

1lb. of flour (white or a mixture of white and whole-meal)	2 teaspoons of salt
½oz. of compressed yeast	2 teaspoons of sugar
	1 pint of tepid milk
	(previously scalded)
	(more if much wholemeal is used)

Put the flour, salt, and 1 teaspoon of sugar into a warmed basin and leave in a warm place. Cream the yeast with the remaining sugar and add the milk. Make a well in the centre of the flour and add the liquid gradually, stirring all the time. Mix the flour and liquid to a dough; knead the dough well for 10 minutes or until it is smooth. Cover and leave to stand in a warm place until it has risen to twice its original size. Turn the dough out on to a floured board and knead lightly. Cut and shape the dough into rolls. Place on a warm greased oven tray and set aside in a warm place to double their size. Bake in a hot oven for about 15 minutes. This amount of



Butterscotch nut rolls.

mixture will make approximately 16 rolls. To give a glazed crust to the rolls brush them with a mixture of milk and beaten egg when they are still hot from the oven.

Shaping the Rolls

Cloverleaf Rolls

For cloverleaf rolls shape small pieces of the mixture into balls and place three balls into greased patty tins.

Swedish Braids

To make Swedish braids shape small portions of the dough into strips about 6in. long. Cut lengthwise into three and plait the dough making sure the ends are pressed together firmly and tucked underneath.

Knots

Shape dough pieces as for Swedish braids and tie a knot in the centre of each roll.

Bread Sticks

Make bread sticks by rolling the dough ½in. thick; cut ½in. strips and roll with the palm of the hand into long smooth rolls about the thickness of a pencil. Cut in 9in. lengths and place on a warm greased pan lin. apart; when nearly baked reduce oven temperature to 350 degrees F. and bake until dry and crisp. These bread sticks are particularly good to serve with soup or salad, or with grills.

Crescents

For crescents roll the dough ½in. thick; cut with a sharp floured knife into 3in. squares. Cut each square in halves diagonally. Brush with melted butter and roll up from base of triangle to point. Twist the ends around to form a crescent.

Pocketbook Rolls

Roll out the dough for pocketbook rolls to ½in. thick. Cut into rounds, using a scone cutter or glass; brush ½ each round with melted butter, crease across the middle of each piece with the back of a knife, and fold over on the crease.

Twists

To make twists shape small pieces of dough into rolls and cut each up the centre lengthwise to within ½in. of the end. Twist the two strips round each other and pinch the open ends together.

Sweet Rolls

The following recipes for sweet rolls are slightly richer and are suitable for serving with morning coffee, afternoon tea, or high tea.

Butterscotch Nut Rolls

Dough	
1 cup of scalded tepid milk	1½ tablespoons of butter (melted)
1 teaspoon of salt	1oz. of yeast
1 tablespoon of sugar	3 cups of sifted flour
½ cup of brown sugar	

Butterscotch Mixture

4oz. of butter	½ cup of chopped nuts
4oz. of brown sugar	

Place flour and salt in a large mixing bowl, cream yeast and sugar together, and add to this the lukewarm milk which has been mixed with the melted butter. Make a well in the centre of the dry ingredients and add the liquid. Mix thoroughly and turn the dough on to a lightly floured board. Knead until smooth and elastic, adding more flour if necessary. Place the dough in a bowl, cover, and leave in a warm place to rise. When the mixture has doubled in size remove it from the bowl, knead lightly, and roll

532—YEAST COOKERY . . .

out $\frac{1}{2}$ in. thick. Brush the top with melted butter and sprinkle with $\frac{1}{2}$ cup of brown sugar, roll up as for a jelly roll, and cut in $\frac{1}{2}$ in. slices. Cream together 4oz. of butter and 4oz. of brown sugar, spread this mixture in the bottom of a baking dish, and sprinkle $\frac{1}{2}$ cup of chopped nuts on top. Place slices of roll on this mixture and allow to stand until the rolls have doubled in size. Bake in a hot oven (400 degrees to 425 degrees F.) for 15 to 20 minutes.

This mixture is sufficient to make $1\frac{1}{2}$ to 2 dozen rolls.

Orange Rolls

1 cup of mashed potato	1 teaspoon of salt
12 cups of scalded milk	$\frac{1}{2}$ cup of sugar
$\frac{1}{2}$ oz. of yeast	2 tablespoons of grated orange rind
About $7\frac{1}{2}$ cups of flour	1 cup of orange juice
2 eggs (well beaten)	$\frac{1}{2}$ cup of butter (melted)

Force the mashed potato through a fine sieve into a large mixing bowl and stir in the hot milk; when lukewarm add crumbled yeast and 4 cups of flour; beat thoroughly, cover and leave to rise in a warm place until doubled in bulk (about 4 hours). Combine eggs, salt, sugar, orange rind, juice, and shortening. Add to light sponge and beat well; gradually stir in the remaining flour until thick enough to turn out and knead. Set to rise again in a greased bowl and when doubled in bulk knead again; roll out to about $\frac{1}{2}$ in. thick. Cut with biscuit cutter into circles, make a crease through the middle of each piece, and brush with melted butter. Fold and press the edges together. Place on a greased tray $\frac{1}{2}$ in. apart, cover, allow to rise slightly, and bake in a hot oven 425 degrees F. 12 to 15 minutes.

This mixture is sufficient to make 4 dozen rolls.

Crumpets

$\frac{1}{2}$ oz. of yeast	$\frac{1}{2}$ oz. of salt
4 cups of flour	$\frac{1}{2}$ teaspoon of bicarbonate of soda
$\frac{1}{2}$ pint of milk	1 oz. of sugar
$\frac{1}{2}$ pint of water	

Scald and then cool the milk until lukewarm. Heat the water until lukewarm and dissolve the yeast in a little of it. Add the sugar to the warm milk and when dissolved add, with the yeast and water mixture, to the flour. Beat thoroughly and while beating gradually add the remainder of the water until the mixture is the consistency of thick cream. Allow to rise (1 hour), cut down, and allow to rise again for about $\frac{1}{2}$ hour. When light add the soda, dissolved in a little warm milk, and the salt. Beat well into the batter. Leave to stand 10 minutes. Place crumpet hoops on a hot lightly greased girdle. Pour in some of the crumpet mixture. When crumpets are full of holes and have risen in the hoops and appear to be drying off they should be turned and baked on the other side.

Doughnuts

$\frac{1}{2}$ oz. of compressed yeast	$\frac{1}{2}$ teaspoon of nutmeg
$\frac{1}{2}$ cup of lukewarm water	2 tablespoons of butter
1 cup of scalded milk	4 cups of sifted flour
1 teaspoon of salt	1 egg
$\frac{1}{2}$ cup of sugar	

Add the salt, sugar, and butter to the scalded milk. When the milk is lukewarm mix in the yeast softened in the water. Add $1\frac{1}{2}$ cups of flour, beat the mixture, and then leave it to rise in a warm place until it is full of bubbles and very light. Beat in the remainder of the flour, then knead the dough well, keeping it as soft as possible.

Return the dough to the basin, cover it, and leave it in a warm place to rise until its bulk has doubled. Turn out on a floured board, roll it $\frac{1}{2}$ in. thick, and cut out the doughnuts. Leave the doughnuts to rise again for 20 to 30 minutes, then fry them in deep fat at 365 degrees F. for 2 to 3 minutes, putting them into the fat raised-side down. Remove, drain, and sprinkle with rolled icing sugar. This recipe will yield about 2 dozen doughnuts.

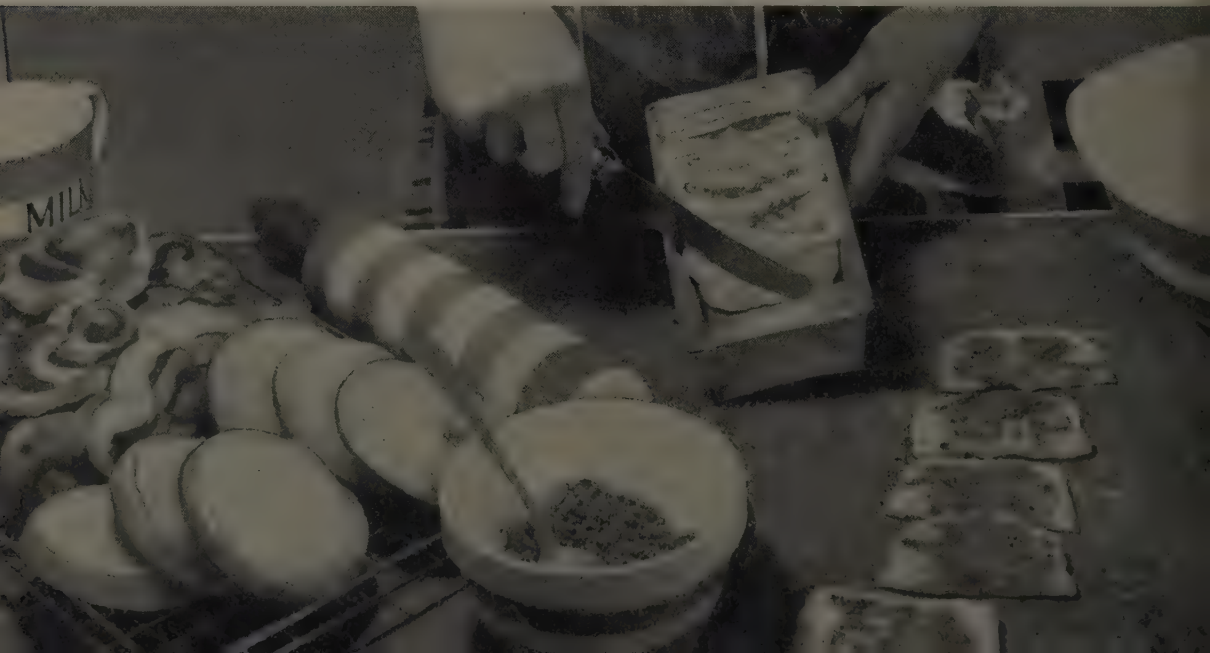
Frying fat is at 365 degrees when a $\frac{1}{2}$ in. cube of bread browns in 60 seconds after being dropped into the fat.

Cinnamon Butterflies

$\frac{1}{2}$ oz. of yeast	$\frac{1}{2}$ teaspoon of salt
$\frac{1}{2}$ cup of water	1 to $2\frac{1}{2}$ cups of flour
$\frac{1}{2}$ cup of scalded milk	1 egg (beaten)
$\frac{1}{2}$ cup of sugar	$\frac{1}{2}$ cup of butter
$\frac{1}{2}$ cup of sugar	cinnamon
$\frac{1}{2}$ tablespoon of cinnamon	sugar

Soften the yeast in lukewarm water. Combine the scalded milk, sugar, salt, and shortening; cool to lukewarm. Stir in 1 cup of flour, add beaten egg, and mix well. Stir in the yeast. Add the remaining flour to make a soft dough. Knead on a lightly floured board until satiny and smooth. Place in a lightly greased bowl, turning once to grease the surface. Cover and allow to rise in a warm place until doubled in bulk (1 to $1\frac{1}{2}$ hours). Punch down; leave to rise again (30 to 40 minutes). Roll out into a rectangle about $\frac{1}{2}$ in. thick. Sprinkle with cinnamon sugar and roll up lengthwise like jam roll. Cut in slices. Place sealed end down on a greased tray and press down with the back of a floured knife. Leave to

BELOW: Dough placed in the tin for ribbon loaf. Cinnamon butterflies and crumpets are on the rack.



rise until light and bake in a hot oven (425 degrees) for 12 to 15 minutes.

Ribbon Loaf

For ribbon loaf use same recipe as given for cinnamon butterflies.

Roll out into a rectangle about $\frac{1}{2}$ in. thick, with a sprinkling of cinnamon sugar and cut into strips to fit a loaf tin. Grease the loaf tin, sprinkle it liberally with cinnamon sugar, and place the strips of dough upright in the tin. Allow to rise and then bake in a moderate oven (375 degrees F.) for 20 minutes. This loaf does not require cutting; the spicy strips will break off quite easily.

Prune-nut Coffee Braid

Dough

Use the recipe for cinnamon butterflies.

Filling

- | | |
|--|--------------------------------------|
| 1 cup of chopped prunes (if hard, soak before cutting) | $\frac{1}{2}$ cup of chopped walnuts |
| $\frac{1}{2}$ cup of finely chopped apple | $\frac{1}{2}$ cup of sugar |
| | 1 tablespoon of lemon juice |

Mix all ingredients thoroughly together. Roll out the dough on a lightly floured board to form a rectangle 14 in. x 8 in. Place on a greased tray. Spread prune-nut filling down the centre of the rectangle. On each side of the filling make four $\frac{1}{4}$ in. diagonal cuts in the dough extending to the edges. Criss-cross strips from side to side and tuck in the end of the last one. Cover and allow to double in bulk in a warm place (30 to 40 minutes). Bake in a moderate oven (375 degrees) for 20 minutes. When cool frost it with a little water icing (lemon flavoured).

Mariner's Wheel Coffee Cake

- | | |
|-------------------------------------|---|
| $\frac{1}{2}$ oz. of yeast | Icing sugar |
| $\frac{1}{2}$ cup of milk | $\frac{1}{2}$ cup of sugar |
| 1 teaspoon of salt | 1 egg |
| 2 tablespoons of butter | Approximately 4 cups of sifted flour |
| $\frac{1}{2}$ cup of sugar | $\frac{1}{2}$ teaspoon of grated lemon peel |
| 3 tablespoons of melted butter | $\frac{1}{2}$ teaspoon of cinnamon |
| $\frac{1}{2}$ cup of lukewarm water | |

Soften yeast in water. Scald milk and add sugar, salt, and shortening. Cool to lukewarm. Add 1 cup of flour and mix well. Add egg, lemon peel, and softened yeast. Mix until smooth. Add remaining flour to make a soft dough. Knead until smooth and satiny. Place in a lightly greased bowl. Cover and allow to rise in warm place until doubled in size (about $1\frac{1}{2}$ hours). Punch down and leave 10 minutes.

Roll out into rectangle about 10 in. x 12 in. Brush top surface with melted butter and sprinkle with cinnamon sugar. With rolling pin make a depression lengthwise through centre of rectangle. Fold ends of dough toward centre, meeting at this depression. Flatten slightly. Brush again with melted butter and sprinkle with cinnamon sugar. Fold in halves lengthwise forming a long, narrow strip. Shape into a ring with sealed edge out on greased baking sheet.



Mariner's wheel coffee cake.

Seal ends. Using scissors, cut through ring almost to centre in slices $\frac{1}{4}$ in. wide. Twist each strip several times. Brush with melted butter. Allow to rise until doubled (45 minutes). Bake in moderate oven (350 degrees F.) 25 to 30 minutes. When cool ice and sprinkle with chopped nuts.

Easter Bun Ring

- | | |
|--------------------------------------|-------------------------------|
| 8 oz. of flour | Lemon glaze icing |
| $\frac{1}{2}$ oz. of yeast | using 4 oz. of icing sugar |
| $\frac{1}{2}$ cup of scalded milk | 1 teaspoon of sugar |
| $\frac{1}{2}$ oz. of butter | 1 egg (beaten) |
| $\frac{1}{2}$ oz. of walnuts | $\frac{1}{2}$ oz. of glucose |
| $\frac{1}{2}$ oz. of sultanas | cherries |
| Egg and milk for glazing | $\frac{1}{2}$ oz. of currants |
| $\frac{1}{2}$ level teaspoon of salt | Rind of 1 small lemon |

Warm sifted flour and salt. Mix the yeast to a cream with the sugar and add half the warm milk. Make a well in the centre of the flour and pour in milk mixture and the beaten egg. Mix to a soft dough, adding more of the warm milk if required. Knead lightly. Roll out into an oblong strip. Cover two-thirds of the dough with one-third of the butter and one-third of the cherries, currants, sultanas, and roughly chopped nuts. Sprinkle on one-third of the grated lemon rind. Fold in three. Turn with fold to left. Roll out and repeat the whole process twice more. Shape into a long roll like a jam roll; twist the ends round and form into a ring. Place on a greased tray and prove until double in bulk. Brush with beaten egg diluted with milk. Sprinkle with a little sugar. To keep the ring a good shape pin a strip of well-greased greaseproof paper round the dough. Bake at 450 degrees F. for 20 minutes until golden brown. Cool. Coat roughly with thin, white lemon icing.

German Coffee Bread

- | | |
|-----------------------------|--|
| 1 cup of milk (scalded) | $\frac{1}{2}$ cup of raisins cut in pieces |
| $\frac{1}{2}$ cup of butter | $\frac{1}{2}$ cup of lukewarm milk |
| $\frac{1}{2}$ cup of sugar | 1 egg (beaten) |
| 1 teaspoon of salt | About 4 cups of flour |
| $\frac{1}{2}$ oz. of yeast | |

Add butter, sugar, and salt to the scalded milk. When lukewarm add the dissolved yeast, egg, raisins, and sufficient flour to make a stiff batter (almost stiff enough to turn out and knead). Cover and allow to rise. Spread in a buttered pan $\frac{1}{2}$ in. thick. Cover and leave to rise again. Before baking brush over with beaten egg and sprinkle with the following mixture (strusel).

Melt 3 tablespoons of butter, $\frac{1}{2}$ cup of sugar, and 1 teaspoon of cinnamon and when the sugar is partially melted add 3 tablespoons of flour.

Bake the coffee bread in a moderate oven (375 degrees F.) about 30 minutes.

Danish Yeast Bread

This is an excellent pastry for the cook who has difficulty in making tender puff pastry, and it can be the basis of many small pastries for the tea or supper table, or for desserts.

There are two steps in the making of it. First the yeast dough must be made and allowed to prove; then it is treated in much the same way as flaky pastry.

Yeast Dough

- | | |
|--|---|
| 1 cup of scalded milk | $3\frac{1}{2}$ to 4 cups of flour |
| 1 oz. of compressed yeast | 4 flat tablespoons of sugar |
| 2 eggs | $\frac{1}{2}$ teaspoon of lemon flavoured |
| $\frac{1}{2}$ teaspoon of almond flavoured | 2 tablespoons of butter |
| 3 tablespoons of lukewarm water | Pinch of salt |



Cold rum babas may be decorated with whipped cream flavoured with rum.

Put the yeast and the lukewarm water into a cup or small basin and leave to stand for 10 to 15 minutes. Heat the milk. Put the sugar, salt, and butter in a large bowl and pour the hot milk over them, stirring until the fat is melted. Cool the liquid until it is lukewarm; then add the eggs while beating the mixture slightly. Stir up the yeast and add it to the mixture; next add the flavourings. Add 3 cups of the flour and stir the mixture until it smooth; then add enough of the remaining flour to make a soft ball of dough; sprinkle the top with flour. Cover the bowl and set it aside in a warm place until the dough has doubled in size.

When the dough has risen sufficiently roll it out on a floured board to form a square about $\frac{1}{2}$ in. thick. Take 1 cup of softened butter and dot half the fat over the dough, leaving a narrow border. Fold the dough in halves and press the edges together. Dot it with the rest of the butter, leaving a border, and fold in halves again.

Roll the dough into a square about $\frac{1}{2}$ in. thick, fold it in halves, and then fold it again crosswise. Repeat this folding and rolling three times.

Place the folded pastry in a greased bowl, cover the bowl, and set it aside for about 20 minutes. It is then ready for use.

Danish Almond Crescents

For Danish almond crescents one recipe of the yeast dough is required. Roll out the dough $\frac{1}{2}$ in. thick and cut it into triangles with bases measuring about $\frac{5}{8}$ in. Roll a little of the almond paste filling into a sausage shape and place it near the base of one of the triangles. Commencing at the base roll it up to enclose the filling and bend it round to form a crescent; then place on a greased baking tray. Allow to rise in a warm place for 20 minutes.

Brush over with egg and bake at 450 degrees F. for 15 to 20 minutes. While they are still hot brush with glaze icing and sprinkle with chopped nuts.

Almond Paste Filling

Cream together $\frac{1}{2}$ cup of butter and $\frac{1}{2}$ cup of sugar. Add an egg, $\frac{1}{2}$ cup of almond paste, and $\frac{1}{2}$ teaspoon of almond essence. Mix these ingredients together until they are thoroughly blended.

Danish Custard Buns (Weinerbrod)

Danish pastry dough
Egg to glaze
Cold, thick custard

Glaze icing
Roasted flaked or
chopped almonds

Roll out the dough $\frac{1}{4}$ in. thick and cut into strips $10\frac{1}{2}$ in. to $12\frac{1}{2}$ in. long and $\frac{1}{4}$ in. wide. Twist the ends in opposite directions. Lay them on baking sheets, forming each into a spiral starting at the centre, and press the centre down, leaving a hollow. Prove as above. Brush with egg and place a small portion of custard in the centre of each bun. Bake in a hot oven (450 degrees F.) for 10 to 15 minutes until golden brown. Brush over the other ring with glaze icing while the buns are hot and sprinkle with nuts.

Fruit Flan

Danish pastry is also suitable for fruit flan cases.

Roll out the pastry dough to $\frac{1}{4}$ in. thick, line a pie plate or sandwich tin with pastry, and fill it with jam or cooked fruit. Bake in a hot oven (450 degrees F.) for 20 to 30 minutes. If desired, the unfilled shell can be left until it has increased in bulk by half before filling, but if this is done, it must be cooked in a very hot oven (480 to 500 degrees F.) for 8 to 10 minutes.

Rum Babas

$\frac{1}{2}$ oz. of yeast
1 teaspoon of sugar
6 tablespoons of warm milk
2 oz. of butter
2 oz. of sugar

$\frac{1}{2}$ teaspoon of salt
 $\frac{1}{2}$ oz. of dried fruit (currants, peel, and raisins $\frac{1}{2}$ cup)
6 oz. of flour
2 eggs

Syrup

4 oz. of sugar
2 tablespoons of rum
 $\frac{1}{4}$ tablespoons of water

Cream the yeast and the teaspoon of sugar until liquid. Add the warm milk and sprinkle the top with a little flour. Cover with a cloth and put in a warm place to begin rising. Leave for 15 to 20 minutes. Use the other ingredients except the fruit to make a cake mixture by the creaming method. Add the yeast mixture and beat hard for 5 minutes. Add the fruit and half fill small greased moulds or muffin tins. Leave to rise to the tops; bake until they feel springy when pressed in the centre. Turn out carefully, pour over the warm syrup, and allow it to soak in. To make the syrup, boil the sugar and water for 5 to 10 minutes and then add the rum. Serve hot or cold. Cold ones may be decorated with whipped cream flavoured with rum.

Ginger Beer

$\frac{1}{2}$ oz. of root ginger (crushed)
1 lb. of white sugar
1 gallon of boiling water
1 oz. of cream of tartar
1 lemon (if desired)
1 tablespoon of yeast

Put ginger, sugar, and cream of tartar in an earthenware pan and pour the boiling water over them. If desired, slice the lemon thinly and add this to the mixture. Allow all to cool; then add the yeast, well crumbled. Cover with a blanket and let it stand until next morning. Strain the liquid through a filtering bag or close sieve. Bottle and fasten corks securely with string. Store in a cool place for 3 days, when it will be ready for use. Make sure the bottles used are sterile and that the corks are sound.

All photographs by Sparrow.



Making Table Mats, Cloths, and Napkins

TABLE mats, cloths, and napkins can be the brightest and gayest part of the household linen cupboard, and for those who can make them at home their cost is relatively low. Embroidery is time consuming but rewarding, for a table set with beautifully embroidered linen is a pleasant sight. To be effective table linen need not be the result of many hours of patient labour, however. Rapidly fringed, machine hemmed, or hemstitched mats and small cloths look very well when they are used with matching china and are chosen with some thought for the general colour scheme, part of which comes from the food itself. To achieve a maximum colour effect table linen, flowers, china, and food colours should all harmonise; if they do, it is possible to make a very simple meal appear both appetising and pleasing to the eye. Some of the ways of making table mats, cloths, and napkins are described in this article by Betty Johnston, Field Officer in Rural Sociology, Department of Agriculture, Wellington.

A VARIETY of table mats and cloths with matching or contrasting napkins makes the task of table setting easy and allows the imagination wide scope for producing interesting and unusual table effects.

It is comparatively simple and inexpensive to make several different sets of table mats from brightly patterned, colour-fast linen, rayon, or cotton. Matching napkins may be made from the same material or from material of one of the dominant colours in the pattern. White damask table napkins undoubtedly have their uses, and many people prefer them for everyday family use, but the smaller coloured or embroidered ones are easier to launder and iron.

Table Mats

Table mats may be made from plain or patterned linen, rayon linen, glazed chintz, heavy-weight furnishing cotton, lace, or organdie or from hardboard treated with an appropriate heat-resistant glaze over its applied design. The design may be hand painted or a picture or transfer could be used. A waterproof heat-resistant varnish was used to seal the mats illustrated on page 537, the floral design being first sketched on to the smoothed and sized surface and then painted with water-soluble poster paints. The same method was used for the child's mat illustrated on the same page, but the reverse surface, which resembled coarse hopsack, was used, its texture adding depth and interest to the design. This

mat was made large enough to catch the spilt food which usually surrounds a young child's plate after a meal. A quick wipe with a cloth wrung out of hot, soapy water is all that is required to keep these hardboard mats clean.

Coloured pictures cut from magazines can be used to make very unusual and attractive mats. A fine line of gold or black paint can be used as a border for glued-on prints and the final coat of varnish makes them waterproof and heat resistant. Thin felt cemented underneath is an added safeguard for easily marked tables.

The edges of fabric mats may be hemstitched by hand or machine. If fine linen is used, hand hemstitching and embroidery can be laborious, but the results will be much admired. A fine, closely woven, white or pastel linen looks best, though heavier, coarser linens look very well worked in Italian hemstitching or in one of the many different peasant designs of Europe.

The first step in making table linen is to draw threads to straighten the

HEADING PHOTOGRAPH: A mahogany mid-Victorian table set with hand-embroidered white Irish linen mats,

Everyone wants a new

© 1976

FRIGIDAIRE

REGISTERED TRADE MARK

First choice the world over!

Despite the tremendous production capacity of General Motors the demand for "Frigidaire" household appliances at present exceeds the supply. To wait, however, is well worthwhile, for with a "Frigidaire" refrigerator, electric range or food freezer

you can be completely confident that you are buying modern design, sound engineering, the utmost dependability. You are buying—in a word—**quality** . . . quality assured by General Motors' long experience and unequalled research and production progress.



FRIGIDAIRE 7.7 cu. ft. De Luxe Refrigerator.

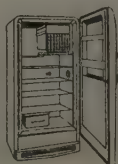
FRIGIDAIRE were first with a full-width American-type Super Freezer Chest. Holds up to 50 lbs. of frozen foods at freezing temperature. Also: full-width Chill Drawer, holding a week's supply of flat cuts of meat; convenient Door Shelves for eggs bottles, etc.; "Quick-ube" Ice Trays; Hydrator for vegetables; adjustable Cold Control; "Meter-Miser" economy.

7.9 cu. ft. Refrigerator
For the larger family. Large Super Freezer, convenient easy-to-reach door shelves, "Quick-ube" ice trays, vegetable hydrator, "Meter-Miser".



Home Food Freezer

Buy when prices are low, freeze and keep food fresh for months. Holds up to 326 lbs. of frozen foods, in convenient storage baskets. "Meter-Miser".



5.5 cu. ft. Refrigerator

For the smaller family. Large Super Freezer, "Quick-ube" ice tray, vegetable hydrator, adjustable cold control, "Meter-Miser" economy.



FRIGIDAIRE Electric Ranges

FRIGIDAIRE introduced "automatic cooking" to New Zealand with these ultra-modern Electric Ranges. Sensational "Cook-Master" switches oven on and off at any set interval—while you're in or out. Other features: "Radiantube" Surface Elements, providing 5 fast economical heats; thermostat oven control; two oven elements; warming drawer; appliance out'et; choice of four models.



Distributed by

FRIGIDAIRE

Division of

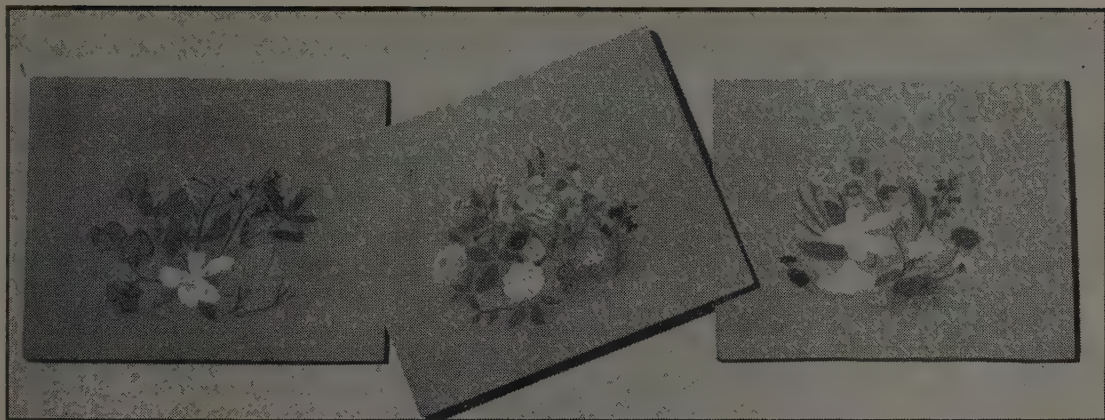
General Motors New Zealand Limited

Refrigerators, Home Food Freezers operate with "METER-MISER" ECONOMY

The simplest refrigerating unit ever built, the exclusive "Meter-Miser" maintains "safe cold" on a mere trickle of current, with plenty of reserve power for hot days. Actually costs less to run than an ordinary light bulb. A sealed unit, oiled for life, it carries a 5-year guarantee.



Through a New Zealand-wide Network of Authorised Dealers.

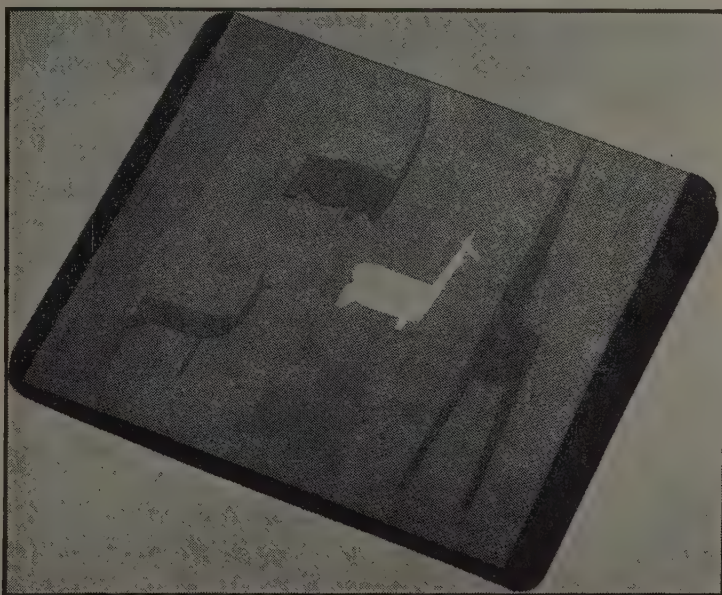


material and to act as guide lines for subsequent cutting. This is very important, especially when the hems are to be finished with hemstitching or drawn thread work.

If round or oval mats are desired, machine hemstitching round a narrow hem may be possible, though picot edging and the application of furniture or candlewick braids are more satisfactory finishes. The braid should be washable and the colour fast. Sometimes the braid can be machined on to the folded edges of the mats, but usually it has to be sewn on by hand. If this is being done, it is as well to turn up a small fold all round the mat with the raw edge uppermost (it will be covered later by the braid) and to use a row of machine stitching to hold it firmly in place.

Fringed mats are very easy to make and take only a few minutes to fringe after the threads have been drawn for hemstitching and cutting. If a patterned material is chosen, it may be possible to use an identical portion of the pattern for each mat, as was done with the striped linen mats shown on page 539. Plain, heavy-quality white linen table napkins were machine hemstitched to use with the mats of this set. A necessary finish to ensure a firm edge is either to hemstitch the fabric $\frac{1}{2}$ in. from the edge of each mat before it is frayed or to run a row of machine stitching round the material afterwards. Rayon linens are inclined to unravel if this precaution is not observed. Rayon linen also spots easily and the stains are difficult to remove by ordinary laundering. Grease marks will suddenly become obvious when the material is ironed. For this reason a floral or patterned rayon is more satisfactory than the plain material for table linen. The edge finish on florals should be simple; either fringing or hemstitching, preferably done by machine, as the quality of the spun rayon (rayon linen) does not warrant the time that would be spent on hand work.

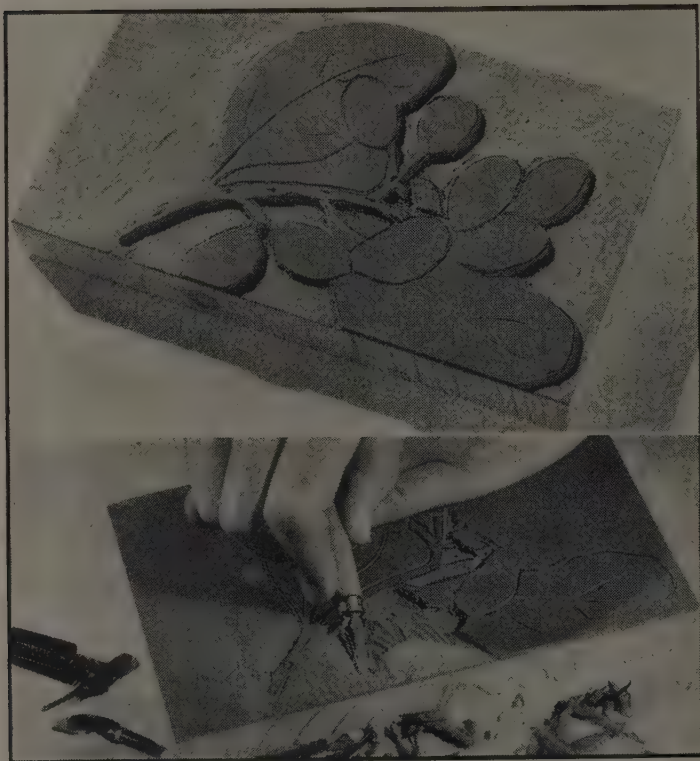
Two examples of hand-painted table mats. For the mats above the design was first sketched on to the smoothed and sized surface and then painted in with water-soluble poster paints. The mats were then sealed with a waterproof heat-resistant varnish. The same method was used for the child's mat below, but the reverse surface, which resembled coarse hopsack, was used.



Hand-printed Table Mats

Hand-printing designs on fabrics is a fascinating hobby and one which can be put to practical use. Hand-printed table linen has an individual stamp which no mass-produced linen can ever achieve. With care, patience, and a little practice the amateur can produce most effective results. The tools required are few. A set of linoleum cutting tools, fabric inks, and an ink roller

can be bought from a stationer; a square of glass about 12 in. x 12 in. can usually be found in the house and its sharp edges can be smoothed; and some heavy-quality, plain inlaid linoleum can generally be obtained from the stock of left-over wallpaper, linoleum, and carpet which most households contain. Several sheets of clean blotting paper, some old newspapers, and a spatula or a knife with a flexible blade complete the list of equipment



Making linoleum blocks for hand-printing fabrics. Upper—The completed master block. The design to be printed is left standing above the block and all superfluous background is cut away. Lower—Cutting the second block, which has been traced from the master block. When this block is complete only the leaves and stems will remain.

and all that remains is to decide on the fabric and a design.

The choice of a suitable design for a table mat may not be easy, and the beginner unused to making her own designs may be easily discouraged. It should be remembered that a table mat is small and also that the linoleum has to be cut so that only the design remains raised above the base. These two factors have a direct influence on the type and size of design. The size of the design must be in proportion to the over-all size of the mat, and small, intricate details must be avoided, as it is very difficult, if not impossible, to cut very fine scrolls and lines on linoleum. Such flowers as rata or pohutukawa are best portrayed by a vague block design rather than by an attempt to cut each petal, which would probably break away. An expert may cut a finely detailed pattern, but this is not for the beginner. Simplicity of line not only helps the operator cutting the

block but also often results in an excellent design.

Making a Block

A linoleum block suitable for printing designs on fabric can be made as follows:—

1. Cement or glue a strip of heavy-quality linoleum on to an appropriately sized block. Allow it to dry under pressure. The linoleum will then be quite flat without ridges or bumps which may later show up on the printed fabric.
2. Trace the chosen design on to the linoleum and cut the outline with a fine nib as shown in the illustration above.
3. Carefully chip away the background, leaving intact only that part of the linoleum which makes up the design.
4. To lighten the effect of a heavy mass of colour a flecked appearance may be made by chipping small

flakes out of the bigger sections of the pattern. A leaf may be treated in this fashion or thin veins may be cut to give it a lighter appearance.

The completed block is known as the master block. If more than one colour is to be used to make up the pattern, the design will have to be broken up into sections. Each colour will require a separate block made from a tracing taken from the master block. In the design shown at left the karaka berries were printed in yellow and later overprinted in light olive green. Here the master block was used to print the whole design in yellow and another block cut from the traced design to show only the leaves and stems was used for the green.

All the blocks are made exactly the same size, each separate section being cut so that it will fit exactly on to the corresponding section on the master block. The pattern when printed in its several colours should show no overlapping or gaps. This requires patience and some degree of skill in cutting the block and printing. The beginner is therefore advised not to be over-ambitious, but to be content with using one or two colours.

Printing on Fabric

The method of printing on fabric with a linoleum block is as follows:—

1. Cover a table or bench with several sheets of newspaper and put a sheet of clean blotting paper on top of them. This will prevent the ink from staining the bench or table. Next stretch the fabric taut and pin or tack it firmly to the table. Table mats should have guide threads drawn ready for cutting or already cut out.
2. Squeeze the ink on to a clean sheet of glass and spread it with a spatula or knife so that when the roller is run over the ink it will be covered evenly. Run the roller over the block, covering the pattern evenly. If the block is too heavily coated with ink, it will make blobs on the fabric. Test the block once or twice on a spare piece of cloth.
3. Place the block firmly on to the fabric and press it down for a minute or so to allow the ink to soak in. A smart blow on the block with a mallet or the fist helps to force the dye to penetrate the fibres, but care must be taken not to move the block. Any movement will smudge the pattern.
4. Lift up the block cleanly, being careful not to let it slide.

Change the blotting paper when new colours are used. This will prevent the colours from running together. Allow the first colour to dry completely before printing the second one. When the pattern has been completed and the fabric is quite dry (it is wise to allow 24 hours for the final drying) the dyes may be set by steaming the material for an hour over swiftly boiling water. The use of a pressure cooker shortens the steaming time to 15 minutes, but only small lots of

material can be done at one time, as the steam must circulate freely round the printed fabric. Finally the material must be rinsed thoroughly in cold water. The dyes should now be colour-fast and able to be washed in warm water and mild soap suds. If too much ink has been used, the surface of the pattern will feel stiff and some of the hardened ink may crack off. This can be avoided by using less ink on the block.

Table Cloths and Supper Cloths

Because of the time taken for laundering them white damask table cloths are seldom used today. Instead smaller cloths of cotton, rayon, and linen, often coloured or brightly patterned, have taken their place. The checked blue and white gingham cloth illustrated at the top of page 541 is attractive, sturdy, easily laundered, and easy to make. A cross-stitch pattern, white on the dark blue squares and blue on the white ones, borders the cloth. Stranded boiling cottons were used for the embroidery.

Seersucker is another material which is often used for small table cloths because it is easy to wash and iron. A crinkled effect is produced by weaving sets of threads at uneven tensions, and a good-quality seersucker should hold this crinkle throughout its life. A cheaper, poorer-quality material has the crinkle stamped on with heated rollers, but this finish will not survive washing. This imitation seersucker should not be confused with another type of crinkled, glazed cotton which has a permanent finish. Price is usually a fairly good indication of the quality of the material and the permanence of the finish. Both seersucker and this permanently glazed cotton are made in bright colours and need only to be hemmed by machine to be ready for use. The glazed cotton should not be boiled, but should be washed in warm, soapy water, rinsed, and hung dripping on the line. Wringing may break the fine surface glazing and spoil the appearance. This material needs little if any ironing, but seersucker may have to be smoothed with a warm iron.

Where there are small children in the family plastic table cloths are very useful. A moderately thick plastic is better than a fine one, which will crumple easily and soon crack. Some people prefer plain colours, but there are many figured, spotted, and striped plastics to choose from, and matching colour schemes today is a comparatively simple matter.

Supper cloths are usually made of fine linen hemstitched and embroidered in self colours or soft pastels. The exquisite Richelieu and Madeira embroideries are well known and need no elaboration, and fine grass linen worked by patient Chinese can also be included in this group of precious linens. There are some New Zealand women who have spent many hours of their school days painstakingly working at needle weaving, darning, and



Cutting table mats using the pattern repeats as guiding lines. This material is heavy cotton and the colours, dove grey, white, daffodil yellow, and black, are woven into the material.

drawn thread and cut work embroideries, which as supper cloths and wagon covers now take pride of place in their linen cupboards. The expert needlewoman needs both time and patience as well as a feeling for good design and a thorough knowledge of stitchery to create a perfect example of her craft. The average woman, however, finds that she has little time or inclination for tedious embroidery and prefers to see speedy results for her labours. Applique work and shadow embroidery on organdie or handkerchief linen are effective and fairly quickly executed.

Applique Work

Small or large patches are used to make up an applique design and these are attached to the background material with small, overcast stitches. The patterns are first cut out of paper and fitted together. Any desirable alterations are made, and then the patches are cut from these paper patterns, allowing $\frac{1}{4}$ in. for turnings. A great variation in effect is possible with this type of embroidery, interest being obtained by means of texture contrasts, stitching, and varying tone values. It is important to choose applique materials which are suitable for the ground on which they are to be attached. Heavy linens look in-

congruous and clumsy on fine lawns or muslins.

The stitchery around the edges of the applique patches is important, as it can alter the whole character of the design. Sometimes the small overcast stitches used to attach the patches form the finished effect, or fine buttonhole, chain, basket, herringbone, or satin stitches may be used. To avoid unsightly wrinkles the grain of the applique design should run in the same direction as that of the background fabric.

Applique can be used as an edging. It is much quicker to do than hemstitching and is very strong.

Shadow Stitch

Organdie, muslin, and handkerchief and grass linens are suitable for working with shadow stitch, as the material must be fine if the stitching, which is done on the wrong side, is to show through. The design is transferred or lightly drawn on to the material and is covered with evenly spaced, long, float threads of fine cotton. Small stitches are taken round the outer edges of the design. Line stitches can be used to connect the pattern, for example, a flower worked in shadow stitch may have its stems worked in fine stem stitch on the right side of the

Now on the Kangaroo Route to London

QANTAS

Announces

THE INCOMPARABLE

“Connoisseur”

ALL FIRST CLASS SERVICE



Linking TEAL Services from New Zealand at Sydney

Fly in Super Constellation luxury — enjoy QANTAS super-service—on the new all-first-class “Connoisseur” Service to Europe from Australia. Limited passenger list . . . delicious full course meals with champagne . . . luxurious Sleeper-chairs . . . spacious lounge . . . constant, courteous attention from a cabin crew of four! And all this costs no more in air fare.

Ask your Travel Agent for details of the incomparable “Connoisseur” Service.

Regular first-class and Tourist Services are also available.

QANTAS AND B.O.A.C.

Qantas Empire Airways Ltd., in parallel with B.O.A.C. and Tasman Empire Airways Ltd.

Inquiries: Leading Travel Agents or TEAL, Auckland, Wellington, Christchurch.

KNZ17



For bounding day-long vitality!

They're a real food—packed with red meat, bone, fat and important food elements. Available in 1½ lb. and 2½ lb. packets, 28 lb. and 56 lb. bags from stock and station agents, chemists and storekeepers.

BONNY
DOG BISCUITS

Manufactured by Bonny Products, Lombard Street, Palmerston North, and distributed by Salmond and Spraggon Ltd., Wellington. 1.4

success every time

Choose Academy—the quick-and-easy patterns

3793

3839

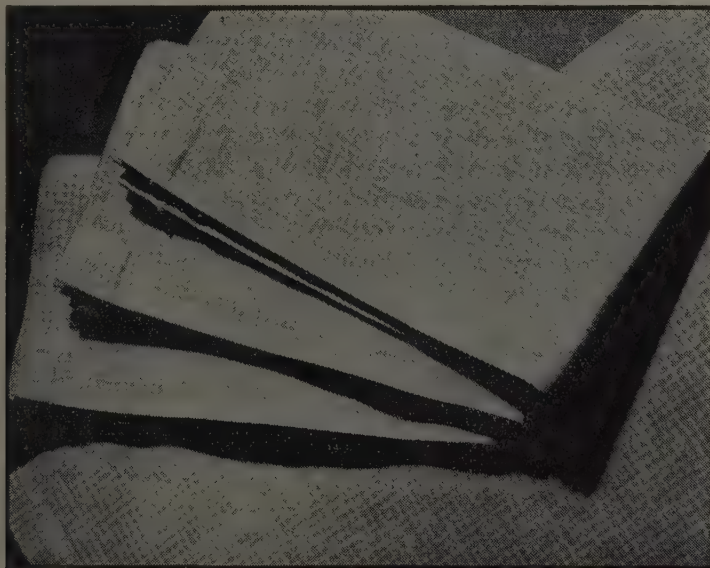


EVERY PATTERN PLAINLY MARKED

A 553



Above—A blue and white checked gingham lunch cloth cross-stitched in white looks most effective when set with golden-brown pottery. Below—Gingham table napkins are rapidly made and very easy to launder.



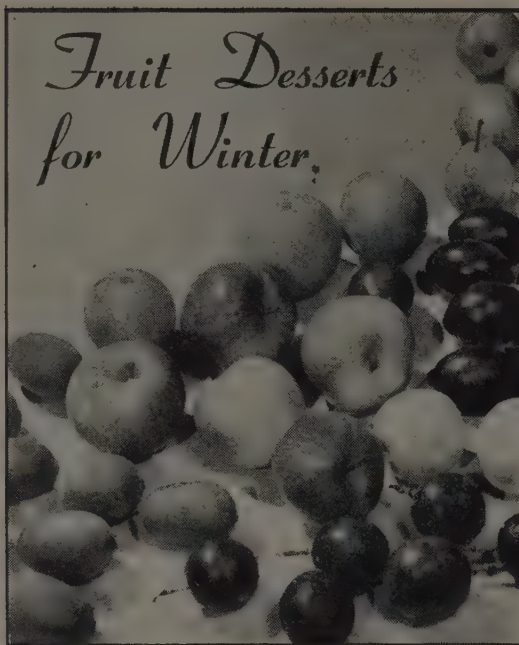
material. Additional embroidery should be kept to a minimum or the shadow effect will be lost.

Table Napkins

Table napkins can be made to match each set of mats or table cloth, but it is more economical to have white or unbleached linen napkins which can do duty with any colour scheme. The damask linen napkins mentioned at the beginning of this article could be used for everyday family use, and one or two sets of fine or coloured linen ones could be worked to match mats used for entertaining. Machine hemmed checked or patterned cotton makes bright and easy to launder breakfast or lunch table napkins. The checked gingham ones illustrated at left were made to match the gingham breakfast cloth and took less than an hour to cut out, press, and machine hem. They are colour fast and can be boiled if necessary, but do not show marks or stains as do plain white table napkins. No starching is necessary, though they seem to keep clean longer when they have been dipped in thin starch.

Table linen can be bright and attractive without being expensive, and the expenditure of a little time and energy can bring rich rewards to the homemaker who has much taste but little money.

Fruit Desserts for Winter.



By MAUD B. STRAIN, Field Officer in Rural Sociology,
Department of Agriculture, Dunedin

THERE are few people to whom fruit does not appeal. This is fortunate because, excluding vegetables, these are the only foods which contain more than negligible amounts of the essential vitamin C. Fruit desserts, relying for their interest on the flavour of the fruit, are usually simple and require less time in preparation than the majority of the more solid, more starchy pudding. When fresh fruit is available it is often preferred raw, but it is almost inevitable that for some part of the year reliance must be placed on bottled fruit and even dried fruit. However, fresh or bottled, raw or cooked, fruit has a definitely high value in maintaining health and vitality.

FRUIT is of all foods the most universally liked. There are those who dislike all fish, for example, but there are few who dislike any and every kind of fruit. Nor is it necessary to wait for each season to bring forth its fruits, as modern methods of preservation and transport make it possible to have fresh fruit all the year round. Moreover, fruits in general retain so much better than other foods their original texture, sweetness, and flavour when preserved.

Winter is the season for hot desserts, pies, tarts, baked fruit, stewed fruit, and fritters; fruit in any form adds interest to a meal. Apples are available practically all the year round as are bananas and citrus fruits. Passion fruit, tree tomatoes, Chinese gooseberries, and less known fruits, such as persimmons and feijoas, follow on after most of the other fruits are finished, but for part of the year continuity of supply is secured from fruit bottled in summer and autumn. Black currants and gooseberries are particularly successful as bottled fruits because of their high vitamin C content, very little of which is lost in the cooking process, and because they can be preserved in water, having the sugar added at the time of use.

Variety in fruit dishes can be obtained by varying the ingredients used. For example apples can be baked in a plain sugar syrup or in one made with brown sugar; they

can be stuffed with nuts, raisins, or other dried fruits; and they can be seasoned with spices of various kinds. Though apples form the basis of these dishes, variety is obtained through the other ingredients used.

Note: Standard measuring cups (8 fluid ounces) and standard measuring spoons are used. All measurements are level. All recipes serve six persons.

Baked Puddings

Baked Bananas and Orange Sauce

6 large bananas	1 lemon	3oz. of cornflour
3 oranges	8oz. of sugar	

To avoid discolouring the bananas peel them with the fingers. Dredge with a little flour and sugar and bake in a moderate oven (350 degrees F.) for 30 minutes. Heat the juice of the oranges and lemon in a saucepan. Add the sugar and cornflour mixed with cold water to the consistency of thin cream, stir well, and cook for 5 minutes. Pour this sauce over the cooked bananas and serve hot with whipped cream.

Crusty Baked Apples

3oz. of butter	2 tablespoons of brown sugar	3 teaspoon of ginger
6oz. of brown sugar	1½ teaspoons of cinnamon	½ teaspoon of nutmeg
3oz. of flour		½ teaspoon of salt
6 apples		

Cream the butter and 6oz. of brown sugar well together. Stir in the flour, cinnamon, ginger, nutmeg, and salt. Pare and core the apples and score deeply with a fork. Pat the sugar mixture on the apples and place in a shallow baking dish. Place a teaspoon of brown sugar in the centre of each apple. Bake in a moderate oven (350 degrees F.) until the apples are tender and the outside is crisp (about 40 minutes). Serve hot with cream. Dates and raisins may be added with the brown sugar to fill the apples.

Banana and Coffee Meringue

3 tablespoons of apricot jam	8 small sponge cakes	1oz. of sugar
1 bananas	1oz. of cornflour	½ pint of coffee
	½ pint of milk	½oz. of butter

Meringue

2oz. of sugar	1 egg white
---------------	-------------

Butter a pie-dish and spread the apricot jam on the bottom. Slice the bananas over this and place the halved sponge cakes on top. Blend the cornflour and sugar with a little of the cold milk and the coffee and heat the remainder of the milk to boiling point. Pour the hot milk over the blended cornflour mixture, return it to the saucepan, and cook for a few minutes. Add the butter and pour over the sponge cakes and bananas. Beat the egg white to a stiff froth and fold in the sugar. Pile this on top of the pudding and bake in a slow oven (300 degrees F.) until the meringue is firm and slightly coloured.

Apple Rolls

½lb. of flour	2oz. of butter	1 large apples
2oz. of sugar	½ teaspoon of salt	8oz. of sugar
2 teaspoons of baking powder	½ cup of milk and water to mix	1 pint of water
		3oz. of butter

In a deep dish make a syrup from 8oz. of sugar and 1 pint of water. Rub the 2oz. of fat into the flour, add the sugar, baking powder, and salt and mix to a fairly stiff dough with the milk and water mixture. Roll this dough out and spread it liberally with the chopped apples. Form into a roll and cut into pieces about 1½in. long, placing these cut-side downward into the simmering syrup. Dot each section with butter and bake in a hot oven (400 degrees F.) until golden brown (about 30 to 45 minutes).

Variation: Instead of cutting the roll into segments and baking them the roll could be placed in a buttered basin, covered with a buttered paper, and steamed for 2½ hours.

Black Currant Crisp

3oz. of butter	3oz. of flour	1 quart jar of black currants
1oz. of sugar	3oz. of wholemeal	

Cream the butter and sugar well together. Mix in the flour and lastly the wholemeal. Strain the liquid from a bottle of black currants (this can be used for making a

jelly or fruit whip) and place the fruit in a pie-dish. If the fruit was bottled in water instead of syrup, sprinkle with half a cup of sugar. Place the mixture on top of the fruit and bake in a moderately hot oven (375 degrees F.) until the fruit is soft and the top golden brown (about 40 minutes).

Variations: Rhubarb or any other tart fruits (gooseberries, apples).

Prune Meringue

1lb. of prunes (cooked) 1 lemon, juice
4oz. of breadcrumbs

Custard

2 egg yolks ½ pint of milk
2oz. of sugar

Meringue

2 egg whites 4oz. of sugar

Chop the prunes and add the lemon juice. Butter a pie-dish and into it put the chopped prune mixture and breadcrumbs alternately. To make the custard beat the egg yolks and sugar with the milk, and stir in a double saucepan over hot water until the mixture thickens. Pour over prunes and breadcrumbs. Make a meringue by beating the egg whites stiffly and folding in the sugar. Pile this over the mixture in the pie-dish and bake in a slow oven (300 degrees F.) for ½ to ¾ hour, until the meringue is firm and very lightly browned.

Steamed Puddings

Almost any fruits may be used for making steamed puddings, but the tart ones are the most successful. Line a pudding basin with the scone mixture used for apple rolls and fill with sliced apples or other fruit. Sprinkle with a tablespoon of sugar and cover with more of the scone mixture. Tie a buttered paper over the top, allowing space for the pudding to expand, and steam for 2½ hours.

Sponges

Fruit Sponge

1 egg 1 teaspoon of baking powder
6oz. of sugar ½ teaspoon of salt
1½oz. of butter 6 to 8 apples
6oz. of flour

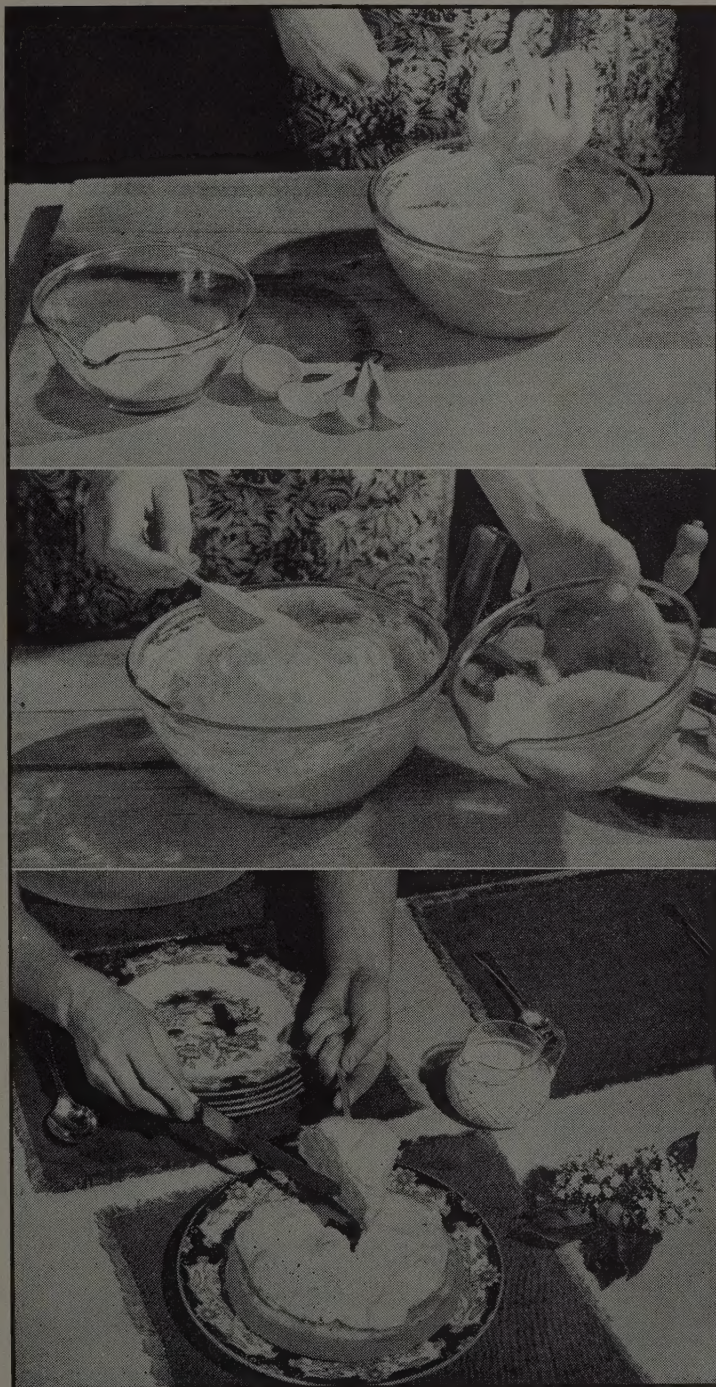
Beat the egg well, add the sugar gradually, and beat until the mixture is creamy. Add the melted butter and beat again. Sift the dry ingredients and add a little at a time alternately with the milk. Place the apples peeled, cored, and sliced (or other fruit) in a pie-dish and pour the batter on top. This cooks more evenly if the fruit is partly cooked and very hot when the batter is poured on. Bake in a moderate oven (350 degrees F.) for 1 hour.

Variations: Black currants, gooseberries, apricots, tart plums, etc.

Upside-down Pudding

Fruit (prunes, apricots, dates, apples, etc.) 2oz. of butter
6oz. of sugar (brown)

Melt the butter in a baking dish and sprinkle the sugar over it to cover the bottom of the dish. Arrange a layer of cooked dried fruit, for example



Making of meringues. Upper—The egg whites must be beaten until they are stiff and dry. Middle—Sugar is added to the stiffly beaten egg whites in the proportion of 2 tablespoons (2oz.) of sugar to each egg white. This is folded in lightly, not stirred in. Lower—The meringue is piled on top of the filled pie shell and baked in a moderate oven until it is a pale golden colour.



Left—Tree tomato upside-down cake with orange sauce to which a passion fruit has been added. Right—Baked bananas garnished with long-shredded Bahamas (tinned) coconut. It is served with orange sauce and whipped cream.

prunes, or thick rings of peeled and cored apples, half apricots, or peaches, and over this pour a batter made as follows:—

2oz. of butter	$\frac{1}{2}$ teaspoon of soda
3oz. of sugar	$\frac{1}{2}$ teaspoon of salt
1 egg	1 teaspoon of ground ginger
2 tablespoons of golden syrup	$\frac{1}{2}$ teaspoon of cinnamon
8oz. of flour	$\frac{1}{2}$ cup of boiling water
1 teaspoon of baking powder	

Cream the butter, add the sugar, and cream together. Add the well-beaten egg and golden syrup and stir it in thoroughly. Mix and sift the dry ingredients and add to the mixture. Lastly stir in the boiling water, mixing quickly, and pour over the fruit. Bake in a moderately slow oven (325 degrees F.) for 40 minutes.

Pies

Tree Tomato and Apple Pie

Fill a pie-dish with a mixture of tree tomatoes and apples in the proportion of two tree tomatoes to one medium-sized cooking apple. To prepare the tree tomatoes pour boiling water over them and allow to stand for a minute, then skin them starting from the stem end. Slice these lengthwise into sixths or eighths. Peel, core, and slice the apples. Fill the dish with layers of apple and tree tomato alternately, sprinkle with sugar, and cover with short pastry. Bake in a hot oven (450 degrees F.) for 10 minutes until the pastry is cooked, then reduce the temperature, and cook slowly until the fruit is soft.

Variations: Quince and apple, blackberry and apple, and Chinese gooseberry. Almost any fruits, fresh or bottled, can be used for making pies.

Apple Pie with Cheese Crust

Line a pie plate with short pastry. Fill the pastry shell with finely sliced apples sprinkled with sugar mixed with a little cinnamon or nutmeg. Roll 2oz. of grated cheese into the pastry for the upper crust, cover the apples with the cheese crust, and bake in a hot oven (425 degrees F.) for 15 minutes. Reduce the heat to 350 degrees F. and bake until the apples are tender (about 20 minutes).

Raisin Pie

10oz. of raisins	1 medium-sized apple
8oz. of brown sugar	1oz. of cornflour
$\frac{1}{2}$ teaspoon of salt	Short pastry
1 lemon, juice	

Put the raisins in a saucepan with sufficient water to cover them. Add the sugar, salt, grated apple, and lemon juice and boil gently for 3 to 4 minutes. Mix the cornflour smoothly with a little cold water and add it to the mixture in the saucepan, stirring while it thickens. Line a pie plate with short pastry, put in the raisin filling, and cover with pastry. Bake in a hot oven (450 degrees F.) for 10 minutes, then reduce the heat, and cook for a further 15 minutes.

Variation: Use an equal amount of pineapple cut small, with juice, in place of apple and lemon juice.

Coconut Apple Meringue Pie

3oz. of coconut	3 egg yolks slightly beaten
2 cups of stewed apple	1 baked 9in. pie shell
4oz. of sugar	4oz. of sugar
1 tablespoon of lemon juice	3 egg whites stiffly beaten for meringue
1 lemon (grated rind)	

Combine the coconut, apple, sugar, lemon rind and juice, and egg yolks. Place this in a double boiler and cook until slightly thickened, stirring constantly. Cool and pour into a pie shell. Top with meringue made by

folding sugar into the stiffly beaten whites. Sprinkle with coconut and bake in a moderate oven (350 degrees F.) until lightly coloured (about 15 minutes).

Hawaiian Fruit Pie

2oz. of flour	1oz. of butter
6oz. of sugar	1 small tin of crushed pineapple
$\frac{1}{2}$ teaspoon of salt	3oz. of coconut
1 pint of milk	6oz. of sugar
3 egg yolks	3 egg whites
2 tablespoons of lemon juice	1 baked 9in. pie shell

Combine flour, sugar, and salt. Add the milk gradually, place in a double boiler, and cook until thickened, stirring constantly. Pour a small amount of the mixture over the slightly beaten egg yolks, return to the double boiler, and cook 3 to 4 minutes longer. Add butter, lemon juice, pineapple, and coconut. Cool and pour into the pie shell. Top with meringue made by folding the sugar into the stiffly beaten egg whites. Bake in a moderate oven (350 degrees F.) for 15 minutes or until delicately browned.

Tarts

Passion Fruit Tart

2 eggs	1 teaspoon of lemon juice
4oz. of sugar	Short pastry
3 passion fruit	
3oz. of butter, melted	

Lemon Tart

2 eggs	2oz. of butter, melted
4oz. of sugar	Short pastry
2 lemons (juice)	

Line a tart plate with thinly rolled short pastry. Beat the eggs well, then add the sugar, melted butter, and passion fruit or juice of two lemons. Mix well together and pour the mixture into the pastry case. Bake in a hot oven (450 degrees F.) on the second rung from the bottom for 15 to 20 minutes.

“Thanks — I really enjoy a Cup of

Southern Cross Tea”

Once you have tasted the full flavour of “Southern Cross” Tea you will always welcome a second cup — it’s a quality tea you will be proud to serve to guests when they call. After a hard day’s work the menfolk too will surely enjoy a cup or two of satisfying “Southern Cross” Tea. Remember that “Southern Cross” is specially blended in Ceylon from the choicest broken orange pekoe for greater tea-bud freshness!



Packed in 5, 10 and 25lb. boxes

and half and full chests

Available from all Branches of



IH
TASK FORCE 7
making the good earth better

Power Facts	Belt H.P.	Drawbar H.P.
Farmall Cub	9.76	8.89
Super A	19.06	17.35
D E D-3 (Brake H.P.)	20	19.4
Super F C	24.45	21.67
Super B M	40.3	36.3
Super BMD	47	42
Super BWD-6	47	42

Have you arranged a free demonstration of these seven IH tractors on your own farm? There has never been a finer range of tractors offered in New Zealand.

Time is short. Task Force 7 will only be operating in your area for another few weeks. ACT NOW! Get in touch with your IH Dealer for full details.



INTERNATIONAL HARVESTER

INTERNATIONAL HARVESTER COMPANY OF N.Z. LTD,
 Branches and Dealers throughout New Zealand